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ESTIMATION OF PERMANENT DISABILITY

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THE Industrial Commission of Minnesota ultimately determines the amount of disability in a compensation case.

Members of the medical profession usually furnish an opinion or several opinions, as the case may be. This opinion is called an estimate of disability. The estimate of disability should be based on the permanent loss of general usefulness of the extremity or portion of the extremity involved. Occupation is not considered in making the estimate.

The estimate of permanent disability is expressed by the medical man as a certain percentage of loss of function of the extremity or portion of the extremity involved. For example:

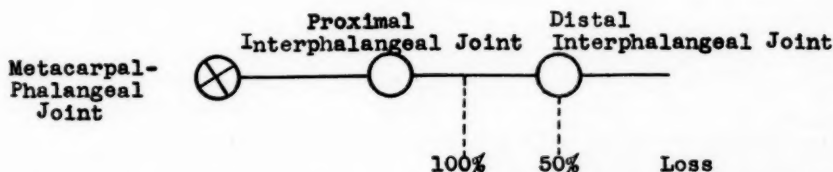
- 10% loss of function of the right arm.
- 10% loss of function of the right hand and wrist.
- 10% loss of function of the right hand.
- 10% loss of function of the right thumb, index, middle, ring, or small finger, as the case may be.

Leg	200 weeks	
Foot and ankle	150 weeks	
Foot	125 weeks	
Great toe	30 weeks	70 weeks
Second toe	10 weeks	
Third toe	10 weeks	
Fourth toe	10 weeks	
Fifth toe	10 weeks	

A knowledge of these values is necessary for the medical man in furnishing an estimate of disability. For example, in a case involving the complete loss of the thumb with additional injury to the palm of the hand, the estimate would be based on a percentage of loss of function of the hand but would exceed a 40 per cent loss of function of the hand for the thumb alone (value 60 weeks) constitutes 40 per cent of the hand (value 150 weeks).

Certain losses by amputation are definitely fixed by law.

FINGER AMPUTATIONS



Amputation of distal phalanx 50 per cent and amputation of distal and half or more of middle phalanx 100 per cent of the finger.

Certain values in weeks have been fixed by law for extremities and component parts.

Arm	200 weeks	
Hand and wrist	175 weeks	
Hand	150 weeks	
Thumb	60 weeks	160 weeks
Index finger	35 weeks	
Middle finger	30 weeks	
Ring finger	20 weeks	
Small finger	15 weeks	

In case the terminal phalanx of a finger has been amputated (50 per cent of finger), and in addition there is limitation of movement at the proximal interphalangeal joint, due allowance must be made for the additional disability, i.e., 50 per cent (loss by amputation) plus additional disability due to the limitation of movement at the proximal joint.

If an amputation has been done below the

knee, leaving a satisfactory stump for a useful artificial limb, the disability constitutes the loss of a foot and ankle. Various other amputations of arms and legs as well as loss of hearing, loss of an eye, disfigurement, and certain combinations of these conditions are covered by law. Permanent partial disability and permanent total disability are also legally defined.†

However, in a large number of cases medical men must form an opinion of the percentage of disability by contrasting the injured member with the normal and, while no absolute rules or values can be set forth, certain principles may perhaps prove helpful, subject to proper correction.

In estimating disability of the arm, four important considerations are:

1. Range of movement.
2. Strength and stability
3. Pain.
4. Tactile sensation.

In estimating disability of the leg, five important considerations are:

1. Range of movement.
2. Strength and stability.
3. Pain.
4. Shortening.
5. Tactile sensation.

In evaluating pain, one is guided by complaints, muscle reaction, limitation of motion of joints, measured atrophy of the muscle and organic findings such as roughened joint surfaces, nerve lesions and other conditions. A fracture of the os calcis may cause little deformity of the foot but if the subastragaloid joint is rough and painful, there may be a considerable loss of function.

Tactile sensation can be fairly definitely tested and, especially in the hand, may cause a definite impairment of function.

Strength and stability of the various portions of the extremities are closely related and are of particular importance in the lower extremity. It must be remembered that full strength returns only with active prolonged use of an injured extremity. The injured member may be compared with the uninjured and the strength of the hands tested by a grip machine and fairly accurately measured.

Important nerve lesions may cause, through

muscular paralysis, loss of range of movement and loss of strength; and by the sensory nerve lesion, loss or impairment of sensation or pain.

Shortening, especially of the lower extremity, is of importance. The disability caused by shortening of the lower extremity, depending on the symptoms produced, frequently falls within this range:

Shortening of 1 inch.....	0-10% of leg
Shortening of 1-2 inches.....	10-20% of leg
Shortening of 2-3 inches.....	20-40% of leg

Range of movement, strength and stability usually reflect fairly well the disability present, for if movement is painful, the usual result is limitation of movement and diminished strength. Strength, as we have seen, can be fairly accurately determined by the grip machine or by actually comparing the strength of the injured and uninjured extremities in various movements against the resistance of the examiner's hands.

It consequently follows that in a large number of cases the estimate of disability is closely related to the loss of the normal range of movement. Certain portions of the normal range in certain joints, particularly the shoulder, are, undoubtedly, of greater value and more generally useful than other portions. This is a matter upon which any particular individual can but express an opinion and only roughly approximate.

To proceed in orderly manner, it would first seem desirable to value the various normal joints with regard to the extremity as a whole. Having fixed a value on the normal joint and knowing the normal range of movement of this joint, it should be possible to fairly accurately estimate the percentage of disability to the extremity occasioned by a certain loss of the normal range of movement at this particular joint.

Finger

Let us first consider the finger. As determined by our Minnesota Law, the amputation of the distal phalanx constitutes a 50 per cent loss of function of the finger and a phalanx and a half or more constitutes 100 per cent loss.

If a finger amputated at the distal interphalangeal joint constitutes a 50 per cent loss of the finger, then ankylosis of this joint alone would seem to furnish a slightly more useful finger or perhaps a 40 per cent loss of function of the finger. Obviously the loss of movement of the two interphalangeal joints (proximal and

†See Labor Laws of Minnesota.

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distal) constitutes 100 per cent loss of the finger; therefore ankylosis of the proximal interphalangeal joint may be said to constitute 60 per cent of the finger.

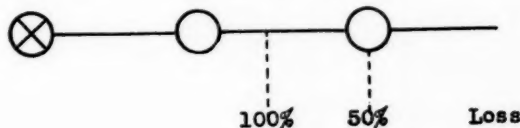
Roughly, the middle finger can be flexed at the various joints from a straight line (180°)

DISTAL JOINT (40 PER CENT OF FINGER) (RANGE 90°)

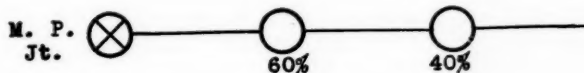
Roughly 10° loss of movement = 5% (loss of function of finger)
Roughly 30° loss of movement = 15% (loss of function of finger)
Exactly 45° loss of movement = 20% (loss of function of finger)

LOSS BY AMPUTATION (FINGER)

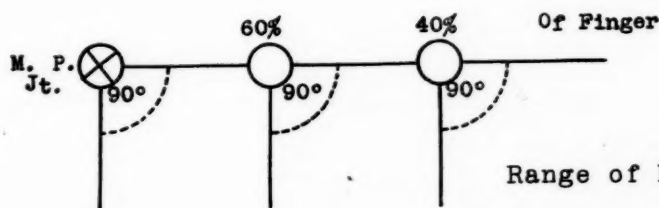
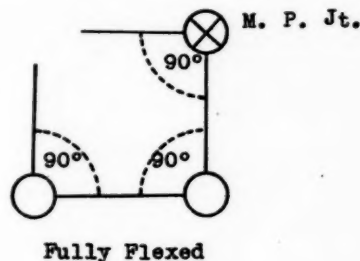
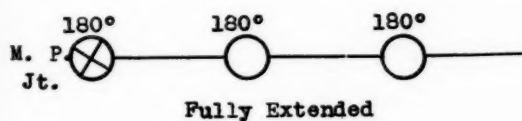
Metacarpal-
Phalangeal
Joint



PERCENTAGE VALUE OF JOINTS OF FINGER



RANGE OF MOVEMENT OF JOINTS



through 90° (to a right angle), each joint having a range of approximately 90°.

Having fixed the per cent of value of the normal joint with respect to the finger and the normal range of movement of this joint, one may then compute the percentage of loss to the finger of any certain number of degrees of loss of movement at this joint.

PROXIMAL JOINT (60 PER CENT OF FINGER) (RANGE 90°)

Exactly 30° loss of movement = 20% (loss of function of finger)
60° loss of movement = 40% (loss of function of finger)
90° loss of movement = 60% (loss of function of finger)

If there is some loss of movement at both joints, compute the percentage loss to the finger

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at each joint and add the two to determine the total.

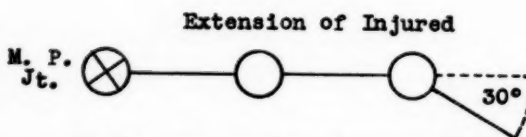
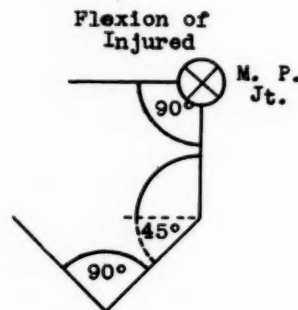
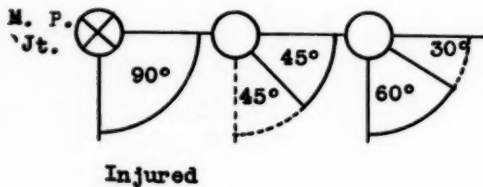
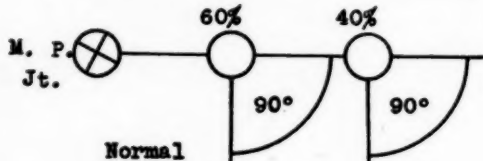
Loss of extension constitutes just as definite a loss of motion as loss of flexion and can be computed in the same manner.

Let us take a concrete example of disability to a finger which has a 30° loss of extension in

the distal joint and a 45° loss of flexion in the proximal joint.

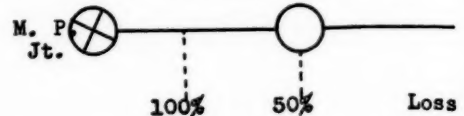
Thumb (60 Weeks)

The first metacarpal is relatively quite movable and in estimating disability to the thumb the metacarpal phalangeal joint may be valued at 60 per cent of the thumb and the interphalangeal joint at 40 per cent of the thumb. Comparison of range of movement should always be made between the normal and injured thumb as there is considerable variation in individuals but the average is probably 45° at the metacarpal phalangeal joint and 45° at the interphalangeal joint when the tip of the thumb is approximated to the palm of the hand at the base of the small finger.

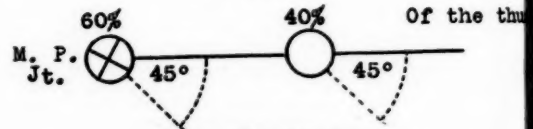


Dark lines represent range of movement at metacarpal phalangeal, proximal and distal interphalangeal joints, respectively. Dotted lines represent loss of normal range of movement.

LOSS BY AMPUTATION (THUMB)



NORMAL RANGE AND VALUATION OF JOINTS OF THUMB



Hand (150 Weeks)

In estimating disability of the hand, the function of the fingers is taken into consideration and, in addition to this, any disability to the palm or dorsum of the hand.

Wrist (Estimate Based on Hand and Wrist, 175 Weeks)

Complete ankylosis of the wrist in good position (30° dorsiflexion) probably constitutes approximately 30 per cent loss of the hand and wrist. One must consider that movement of the wrist, when lost, prevents the individual

	Metacarpal Phalangeal	Proximal	Distal Joints
Value of Joint (% of finger).....	60%	60%	40%
Normal Range	90°	90°	90°
Range of Injured Finger.....	90°	45°	60°
Loss of Range.....	0°	45°	30°
Loss (exactly) at Proximal Joint.....	45°	or ½ of 60% equals	30%
	90°		
Loss (roughly) at Distal Joint.....	30°	or ½ of 40% equals	15%*
	90°		
Total Percentage Loss of Finger	45%		

*Take closest 5 per cent.

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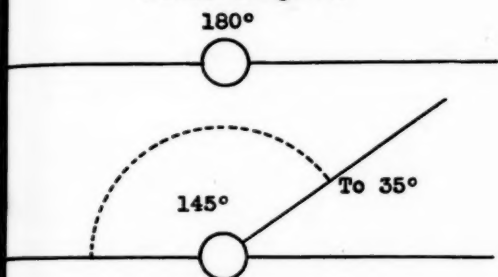
making normal use of the hand by interfering with getting the hand into proper position. Any actual injury to the hand constitutes an additional disability. Wrist joint movements vary considerably but usually the normal and abnormal joint movements can be compared and a fairly definite estimate obtained.

WRIST (30 PER CENT OF HAND AND WRIST)

Average normal range as follows (but check with uninjured wrist):

Palmar Flexion	60°	} Range 120°
Dorsiflexion	60°	
Radial Deviation	15°	} Range 45°
Ulnar Deviation	30°	
Pronation	90°	} Range 180°
Supination	90°	

Elbow (50 Per Cent of Arm) Normal Range 145°



The normal range of the elbow is 145°.

With these figures in mind, one can compute the portion of 50 per cent which a certain amount of the loss of the normal range occasions.

Shoulder (Including Scapular Movement) (65 Per Cent of Arm)

Abduction	180°	} 135°*
Forward Elevation	180°	
External Rotation	45°	
Internal Rotation	90°	

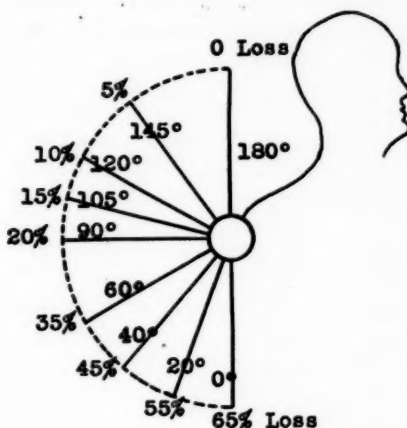
*Judged by forearm with elbow at a right angle. Not important usually.

Shoulder and scapular movement need not be differentiated for this particular consideration.

External and internal rotation usually do not play a very important part as scapular fixation very rarely occurs.

Movement below the level of the shoulder would seem to be more valuable than movement above this level and value of movement would seem to decrease as the arm travels from the shoulder level to a straight overhead position. In the upper range (145° to 180°) a slight back-

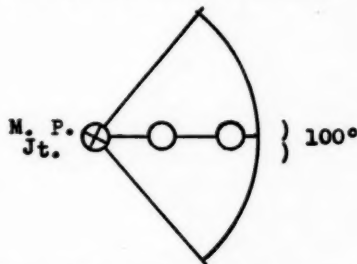
ward or lateral bending of the body compensates and this range is infrequently used. A man 5 feet 6 inches in height with arm extended to 180° attains approximately the level of the hand that a man of 6 feet in height reaches with the hand when the arm is elevated to 145° at the shoulder.



Toes

It is practically impossible to measure accurately individual joint movement in toes; consequently the arc of the tip of the toe describes

TOES (COMPARE WITH NORMAL)



Range (Arc of Tip Approximately 100°)

Loss of 10° equals 10%
Loss of 50° equals 50%

in moving from full flexion to complete extension is a better index. Pain on movement is an important factor in disability of toes as a painful toe may easily be much more troublesome than an amputated toe.

Foot (125 Weeks)

Any injury to the foot involving more than disability to the toes but not affecting the ankle joint, should be estimated on the foot. This in-

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cludes the toes, metatarsal and tarsal bones and the subastragaloid joint.

SUBASTRAGALOID JOINT (25 PER CENT OF FOOT)

Inversion35° } Total 45°
Eversion10° }

Here again pain is an important factor. A painful subastragaloid joint may create more disability than an ankylosed joint; consequently subastragaloid arthrodesis may be indicated on occasions. Pain and stability are more important factors in the lower extremity than in the arm. On the contrary, loss of movement in the lower extremity is less important than in the arm.

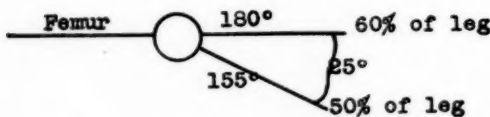
ANKLE (25 PER CENT OF FOOT AND ANKLE)

Plantar flexion35° } Range 45°
Dorsiflexion10° }

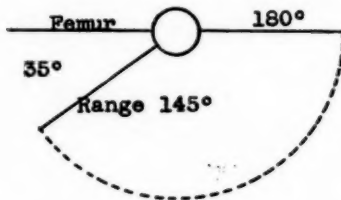
Knee (50 Per Cent of Leg) (Range 145°)

Ankylosis of the knee in a favorable position, 25° of flexion (155°) probably results in approximately a 50 per cent loss of function of the leg. In an unfavorable position the disability is higher.

ANKYLOSIS OF KNEE



NORMAL RANGE OF KNEE MOVEMENT

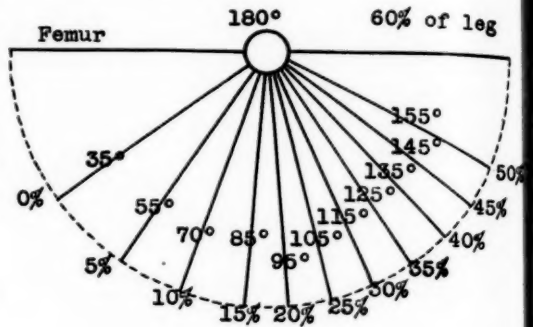


The most valuable range of movement of the knee probably lies between 155° and 85°. If the knee can not be flexed to 155°, it renders the leg very awkward. On the other hand, flexion beyond 85° probably becomes less important, relatively.

Stability of the knee is of great importance. An individual who has a good range of movement, but on account of lateral instability of the knee constantly requires a large knee cage, prob-

ably has approximately a 35 per cent loss of function of the leg.

Normal Range 145°
Value 50% of Leg



Hip Joint (60 Per Cent of Leg)

Abduction40° } 70°
Adduction30° }

Internal Rotation30° } 70°*
External Rotation40° }

*Judged by patella or foot with leg straight or by the leg (below the knee) with hip and knee flexed to a right angle.

Flexion } 135° (Important)
Extension }

Abduction, adduction, internal and external rotation are usually not nearly as important as flexion and extension.

A fair degree of precision is desirable in determining these measurements. A grip machine, an instrument for measuring angles, and a tape measure are the only equipment necessary.

In expressing an estimate of permanent disability, one must bear in mind that one is estimating the amount of disability which will actually be permanent, that is, the amount of disability which will eventually be present after medical treatment and reasonable use of the extremity have largely accomplished all improvement possible.

The figures and percentages set forth are not based on any book or article but simply represent one opinion formed and gradually evolved over a period of years* and presented to the medical profession of Minnesota hoping that it may tend to clarify our opinions in this rather intricate matter.

*Somewhat similar but less comprehensive paper, without diagrams, read at noonday session of Hennepin County Medical Society approximately ten years ago.

ENLARGEMENT OF THE HEART* Its Recognition by the Radiologic Method

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TO determine the presence or absence of enlargement of the heart is obviously of great importance. Cardiac enlargement, if present, generally indicates myocardial disease. Furthermore, the extent of cardiac enlargement is a fair index of the severity of myocardial involvement and in a large measure provides the most satisfactory basis for prognosis.

For the establishment of a diagnosis of cardiac disease, the physician depends chiefly on the symptoms and physical findings. The time-honored symptoms associated with cardiac disease are of inestimable value and will continue to occupy a position of great importance in cardiac diagnosis. On the other hand, certain physical signs have met with reproach in the past and are continuing to be met with increasing disfavor because by their employment the range of precision afforded by such instruments as the electrocardiograph, the sphygmomanometer and the x-ray cannot be attained. The value and potentialities of the x-ray in modern cardiology is the subject I wish to discuss.

X-ray or radiologic visualization of the heart is now indispensable in cardiac diagnosis. It offers us an accurate and detailed knowledge of the heart as an anatomic structure, both in its normal and pathologic states, information which extends far beyond the reach and scope of percussion and palpation.

Gross enlargement of the heart can easily be detected in most cases by percussion and palpation. However, slight degrees of enlargement cannot be recognized with certainty by these methods. The difficulties encountered in the use of the percussion method in the obese, the emphysematous and in the female sex are well known. Furthermore, it is a highly subjective method in which the personal equation is far too great. Too often have we been disillusioned by the fantastic ideas that have been and still are held regarding the accuracy that can be obtained by percussion. It can give us only a rough estimate of the transverse diameter of

the heart and tells, under favorable conditions, whether there is enlargement in the conus area.

While the percussion method should not be discarded in the routine bedside physical examination, its limitations and the inaccuracies that attend its use should be constantly kept in mind. Sir Thomas Lewis,⁸ in speaking of percussion, stated: "It is crucial in measuring to know the error of the method. To have an inaccurate measure may be regrettable, but to have it and not to know it is deplorable."

Because of the lack of faith in the percussion method, recourse has been made to the method of palpation in evaluating cardiac enlargement. This is a valuable bedside technic, but its scope is limited. It offers accurate information about the left ventricle. However, it can be misleading when there is displacement of the heart from any cause or when tachycardia is present.

The Radiologic Method

While the radiologic method for the visualization of the living heart has been employed for many years in Europe, it can be said that its use is still in its infancy in this country, particularly in this region. It is now a universally observed fact that the most experienced cardiologists are skilled in the use of the fluoroscope and many will defer a final opinion until after the radioscopic examination has been completed. What information may one expect to gain by submitting the patient to routine radiological examination? Certainly no organ is so well placed for x-ray visualization as the heart. In the first place, it is almost completely surrounded by transparent lung tissue, and, by rotating the patient, it can be viewed from all aspects. An idea of its volume can be immediately obtained, as well as its position in the chest. In the act of turning the patient, each individual chamber can be identified and scrutinized as to size and shape. The great vessels of the heart as they emerge from their respective chambers and extend beyond their origins can be critically examined. In addition to the visualization of the component parts, the character and extent of

*From the Department of Medicine, University of Minnesota Hospital, Minneapolis. Read before the annual meeting of the Minnesota Heart Society, November 17, 1937.

pulsations of the heart and its pedicle can be recognized and evaluated. Calcification in the pericardium, aortic arch, and heart valves can be actually visualized. Lastly, in cardiac failure,

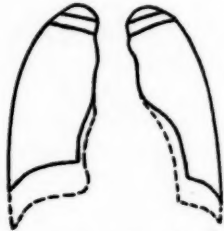


Fig. 1. Outline drawing of normal heart showing effect of changes in height of diaphragm on cardiac silhouette. Continuous line: the end of expiration. Dotted line: the end of deep inspiration. It will be noted that with the lowering of the diaphragm both cardiac borders moved toward the midline. The apparent increase in the size of the heart as a result of a high diaphragm often can give a false impression of cardiac enlargement.

secondary changes that occur in the lung fields and pleural spaces can be recognized.

To disregard this method of examination, Rösler¹³ states, means to renounce much of what our best trained sense organ, the eye, can perceive. It has been rightly stated that the radioscopic method provides a means for performing a veritable biopsy of the living heart.⁹

The shape and position of the normal heart as seen by radioscopic examination is variable, depending on a number of factors. Indeed, the chief difficulty in the routine application of radiocardiography is not in the technic, which can be easily mastered, but lies in the interpretation of normal variability and in the recognition of slightly abnormal enlargement. The chief factors upon which alteration in shape and position of the normal heart depend are, for example, age, constitutional build, respiration and position of the diaphragm. It has been demonstrated on anatomical grounds that the contour of the chest cavity determines the form and position of all the organs contained therein. Hence, hearts contained in round chests have a more circular circumference, while those found in flatter chests are more oval in appearance. Individuals of the sthenic type, where the development of the trunk predominates, give the following picture: The mediastinal shadow is short and wide and the diaphragm is high in position. The heart shadow is decreased in height and tends to be boot-shaped—that is, it is tilted upward and to the left. On the other hand, those of the asthenic habitus,

in which development of the extremities and vertical dimensions prevail, give a different roentgenological picture. The mediastinal shadow is narrow and long, the diaphragm is low in position and the cardiac silhouette is centrally located, giving the so-called drop heart appearance. The high diaphragm resulting from increased abdominal obesity, meteorism or ascites may cause the heart to assume a transverse position, so that it looks larger than it actually is. Too often a diagnosis of cardiac enlargement is made in these cases, and occasionally healthy men are rejected for life insurance or positions involving physical strain because percussion or palpation suggests that the apex beat is outside the nipple line. The increase in transverse diameter of the heart with advancing age is often not due to an actual increase in heart size, but may be a result of two other factors. The diaphragm is situated higher and an arteriosclerotic and elongated aorta tends to push the heart down on the already elevated diaphragm, thus giving one the impression that there is an increased surface area of the cardiac silhouette. In children the diaphragm is high and the heart appears large in a relatively small chest. One has only to observe the large difference between the position, shape and apparent size of the heart in deep inspiration and expiration to be convinced of the marked variation in shape and apparent size that may occur (Fig. 1).

Parkinson⁹ has emphasized the fact that slight scoliosis, particularly in children of school age, may displace the apex beat outward a trifle beyond the nipple line, and, in addition, may result in an exaggerated apex beat, which gives the examiner a false impression of cardiac enlargement. This source of error is present even in radiologic examination. However, by turning the patient slightly to the right, this distortion can be corrected and the cardiac shadow brought back into its normal position.

Cardiometry

Cardiometry, or the quantitative method of determining cardiac enlargement, consists of measuring the distance between certain landmarks on the cardiac silhouette and comparing these measurements with those of normal hearts. For many years investigators have elaborated methods for making cardiac measurements, and have compiled voluminous data upon which to establish normal standards for heart size. After

critically examining the literature, Rösler¹³ states that the majority of publications on the subject reveal much evidence of vast waste both of energy and material with resulting confusion and contradictory conclusions. Probably the first method proposed, one which is still in vogue today, is the cardio-thoracic ratio, the relationship of the transverse diameter of the heart to the internal diameter of the chest at its base. In people of normal build, the diameter of the heart should not exceed 50 per cent that of the chest. However, variations are many and this method is too unreliable as a guide as to whether a heart is slightly enlarged.

The investigations of Hodges and Eyster⁵ are worthy of note. They have shown that the cardiac transverse diameter could be best correlated with body size, providing height and weight were taken into consideration. As a result, they have developed a formula for predicting the transverse diameter of the heart. Their tables would appear to represent the most scientific attempt from which to estimate the mean physiologic heart size. Authors on the subject of cardiometry agree that the most accurate method to estimate heart size is by determining cardiac volume. Thus, Rohrer¹⁴ attempted to determine heart volume by taking measurements in two planes, and succeeded in obtaining fairly accurate results. These results, confirmed by Kahlstorf,⁶ have not yet been routinely introduced into clinical use. A method of determining surface area has been introduced with the hope that the cardiac area will afford a finer index of cardiac size than linear measurements. The difficulty of this method lies in the fact that the upper and lower borders of the heart cannot be sharply demarcated from the vascular shadow above and that of the liver below.

Cardiometry, complicated and bestrewn with imperfections, is, with few exceptions, hardly suitable for routine clinical use. I cannot recall in any instance that the numerical measurements of the heart have afforded me any information not gained by fluoroscopy and inspection of the six-foot film, except where measurements are utilized for comparative purposes in the same individual over a period of time.

Moreover, from an etiologic point of view, it is not so much the total size of the heart that concerns us, but rather the alterations that may

occur in its shape. Enlargement of the heart rarely affects all chambers to an equal extent. It has its origin in a certain specified chamber or several chambers, depending on the location of the pathologic process. For example, the strain in hypertension is primarily on the left ventricle, which enlarges in its characteristic manner, in emphysema the strain is on the pulmonary artery and conus of the right ventricle, in mitral stenosis on the left auricle and the right ventricle. Enlargement, with rare exceptions, is therefore regional and in each instance a characteristic pattern of the heart shape is evolved, depending on the seat of the cardiac strain. It can be seen, therefore, why a change in the shape of the heart is of greater importance than the variation in heart size alone. By the recognition of the various patterns of the heart shape, we are thus able to obtain corroborative evidence of the cause of enlargement and to recognize localized changes in early stages. The successful application of the radiologic method in studying cardiac enlargement depends on the recognition of these various pathologic configurations in heart shape. Before this can be attempted, one must be thoroughly acquainted with the normal radiologic anatomy of the heart and great vessels as visualized in the chest from the standard three positions.

Radiologic Anatomy of the Heart

Anatomically the heart is a three-dimensional organ. Radioscopic examination permits study of the heart in three planes; namely, the antero-posterior, the right oblique, and the left oblique positions. In this routine method we inspect the contour of the cardiac chambers from three viewpoints.

In the anteroposterior view (Fig. 2) three borders are visible: the right, left and inferior. The right and left borders of the shadow are easily seen, the inferior border is for the most part lost in the shadow of the diaphragm. The right border beginning superiorly extends downward in an almost straight line for a short distance. This is the shadow of the superior vena cava which at its lower border forms a small notch where it blends into the convex shadow of the right auricle. Just medial to the notch is the origin of the ascending aorta. The right ventricle forms most of the shadow seen anteriorly.

The left border of the heart and great vessels is considerably longer than the right. The most superior shadow is semicircular in contour and constitutes the terminal portion of the aortic arch

hepatic angle in which is the shadow of the inferior vena cava. The latter is made visible when the patient takes a deep breath. Behind the contour of the posterior border of the heart is

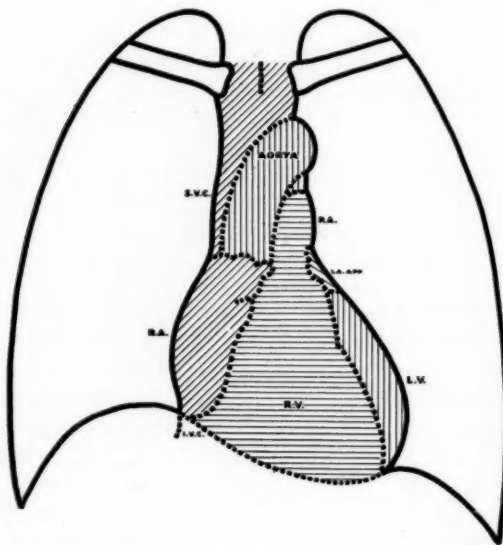


Fig. 2. Outline drawing from teleoradiogram to show normal relationships of cardiac chambers and great vessels in anterior position (after Parkinson and Bedford).

and beginning of the descending aorta. It is often variable in prominence. This shadow is known as the aortic knuckle or knob. Just below this is a flat arch somewhat longer than the aortic shadow. This represents the beginning of the pulmonary artery and uppermost portion of the right ventricle (conus arteriosus). Inferior to this is a small arch, the left border of the left auricular appendage. The remaining and major portion of the silhouette is the left ventricle which forms an elliptical border extending into the left lung field and then turning back toward the midline.

The patient now makes a half turn to the left, bringing the right shoulder to the screen anteriorly so that he is examined through the right chest. This is the right oblique position (Fig. 3). This position affords an excellent view for studying enlargement of the left auricle, pulmonary artery and conus of the right ventricle. The shadow of the left auricle forms the upper two-thirds of the posterior border of the right auricle. Below this is the cardio-

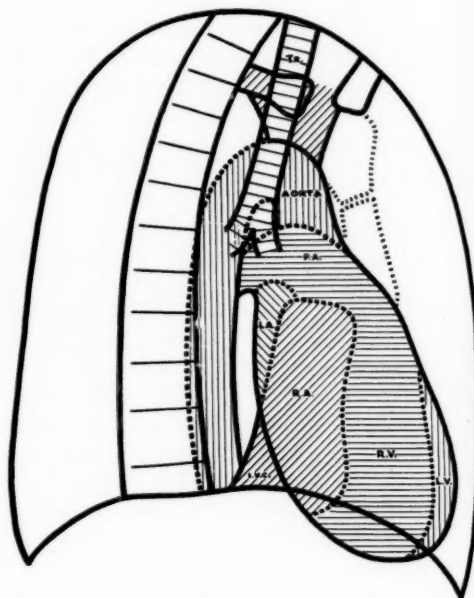


Fig. 3. Outline drawing from teleoradiogram showing normal relationships of cardiac chambers and great vessels in the right (I) oblique position. (After Parkinson and Bedford.)

the clearly illuminated post-mediastinal space. To obtain maximum illumination through this space the patient should be rotated further to the left. (70°). Enlargement of the left auricle partly or completely obliterates the upper part of this space. Massive enlargement of the left ventricle obliterates the lower portion of this area. Anteriorly, if the rotation is only slight, the shadow of the lower portion of the left ventricle participates in the contour. If rotation is greater, the right ventricle becomes border forming. The greater portion of the anterior contour in the right oblique is formed by the conus region of the heart and the pulmonary artery and represents the so-called outflow tract of the right ventricle. This contour, like the one made by the left auricle, represents an important landmark in early pathologic lesions affecting the right side of the heart. Above this appears the shadow of the long aortic arch which sweeps posteriorly and superiorly to disappear in the shadow of the spine. The anterior mediastinal

space, like the posterior one, should always remain clear. The aortic, pulmonary and left auricular impressions of the barium filled esophagus are best studied in the right oblique position.

of the aortic arch and inferiorly by the roof of the left auricle and posteriorly by the descending aorta. Under normal conditions it is fairly well illuminated. Crossing it is the left branch of

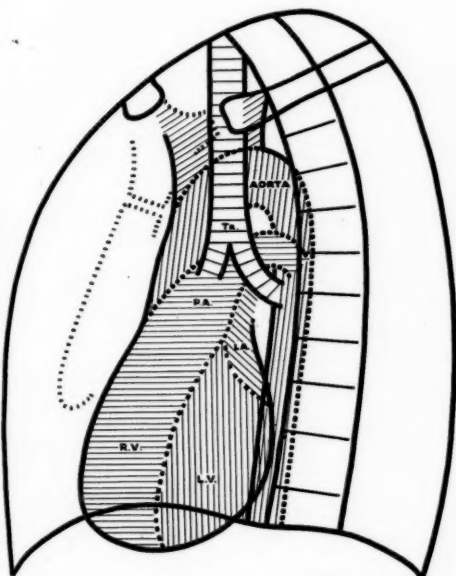


Fig. 4. Outline drawing from teloradiogram showing normal relationships of cardiac chambers and great vessels. In left (II) oblique position (after Parkinson and Bedford).

Continuing the routine fluoroscopic examination, the patient is now turned half right and examined through the left side of the chest (Fig. 4). It has been said that this radioscopic view will eventually prove to be most valuable in studying cardiac enlargement. Here, the cardiac shadow appears as if the heart were cut in sagittal section. In this view it is possible to closely estimate the position of the interventricular septum. The ventricles make up approximately two-thirds of the cardiac silhouette, the shadow of the right ventricle in front and the left ventricle posteriorly. Normally, the posterior border of the left ventricle stands well away from the spine. The stem of the pulmonary artery is fairly well visualized in this view. The aortic arch is well seen sweeping up and posteriorly. This is an excellent view in which to study pathologic changes that occur in the aorta; namely, those due to arteriosclerosis, hypertension, syphilis and congenital defects.

An important landmark in the left oblique position is the "aortic window" (Fig. 5). It is bounded superiorly by the inner concave border

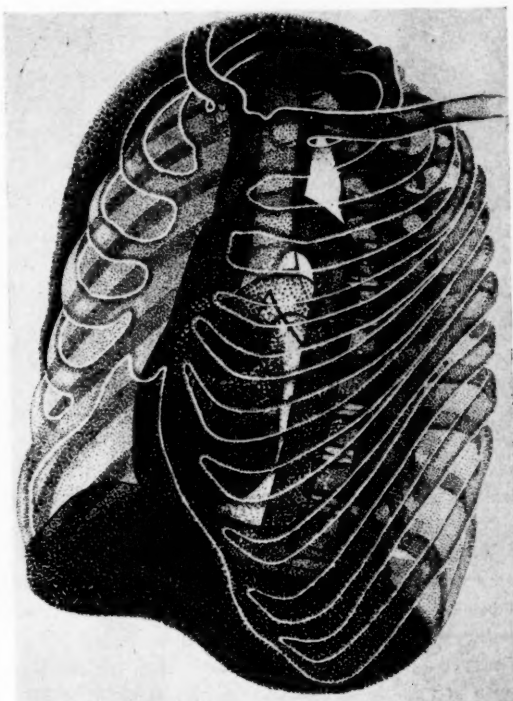


Fig. 5. Special drawing of normal teloradiogram in the left (II) oblique position, to show the aortic window and super-aortic triangle (after Parkinson and Bedford).

the pulmonary artery and in it lies the left main bronchus. In pathologic states such as hypertension and arteriosclerosis of the aorta it enlarges. In massive enlargement of the pulmonary artery, especially its left branch, the window is obliterated. In enlargement of the left auricle it is made smaller and the left bronchus is elevated.

Recently, Parkinson and Bedford have described a new radiologic landmark in the left oblique position (Fig. 5). This is a translucent triangle seen surmounting the upper border of the aortic arch when the subject is rotated 45° or more. The anterior border is formed by the left subclavian artery, the posterior border by the spine, and the base by the roof of the aortic arch. The aortic triangle is diminished by elevation, elongation, or dilatation of the aortic arch. An intrathoracic goitre or aneurysm of

the arch may encroach upon it. The triangle is enlarged by conditions which lower the aortic summit and by emphysema. By utilization of the base of the triangle as the upper point and the

hypertrophy that the increase in the size of the left ventricle can be recognized with certainty.

The aortic valvular lesions which produce left ventricular enlargement are aortic stenosis, either

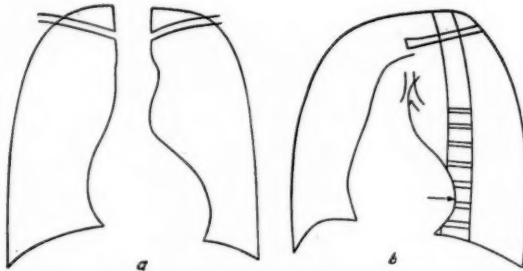


Fig. 6. Outline drawings from case of aortic stenosis in young male, aged twenty-two, blood pressure 108/87. Systolic thrill over aortic area. Harsh systolic murmur over aortic area transmitted to vessels of neck. (a) anterior view: aortic configuration with slight enlargement of left ventricle downward and to the left. The globular appearance suggests marked hypertrophy with slight dilatation. Fluoroscopic examination showed diminished pulsatory amplitude, tardus in character, of left ventricle and aortic shadow. (b) Left oblique view: left ventricle border projecting into the vertebral shadow.

roof of the aortic window as the lower point of measurement, the measurement of the diameter of the arch of the aorta is often possible.

Left Ventricle.—The most vulnerable of all chambers of the heart to enlargement is the left ventricle. Fortunately, from a radiologic viewpoint, enlargement of this chamber is comparatively easy to recognize. The difficulty lies not so much in determining whether or not the left ventricle is enlarged but in deciding whether it is simply displaced to the left. As already stated, the apparent size of the left ventricle depends much upon the position of the diaphragm. Furthermore, considerable enlargement of the right ventricle, particularly from right-sided congenital lesions, can displace the left border outwards, giving one the impression that the left ventricle is enlarged. However, this point can be settled by turning the patient well into the left oblique position (left shoulder to the screen). When the left ventricle enlarges it does so posteriorly as well as laterally. If, in this view, the posterior border of the left ventricle extends beyond the anterior shadow of the spine it is to be considered enlarged. However, if it stands clear in front of the spine the apparent enlargement seen in the anterior position is in all probability a result of displacement rather than enlargement.

It is difficult, if not impossible, to recognize hypertrophy by radioscopic examination. It is only when dilatation has supervened upon the

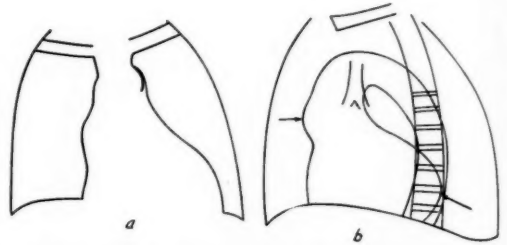


Fig. 7. Outline drawings from teloradiograms from case of syphilitic aortitis and aortic incompetence. (a) Anterior view: large left ventricle, prominent ascending aorta which is irregular in outline and prominent aortic knuckle. (b) Left oblique view: Cardiac silhouette extends far into shadow of spine—left ventricular enlargement. Widened ascending aorta with localized outpouching.

arteriosclerotic or rheumatic in origin, and aortic incompetence which may be due either to rheumatism or syphilis. Isolated aortic stenosis alone, as a rule, causes only moderate enlargement of the left ventricle (Fig. 6 a and b). Left ventricular enlargement due to arteriosclerotic stenosis of the aortic valves can at times be differentiated from that due to rheumatism by radioscopic examination. The differentiation lies in recognizing calcification of the aortic valve and calcification of the aortic arch in arteriosclerotic stenosis. Furthermore, in aortic stenosis due to arteriosclerosis, the aortic knob is quite prominent, and the arch of the aorta can be seen to appear as ectatic. Aortic incompetence can be differentiated from aortic stenosis without any difficulty by the character of the pulsations of both the aorta and left ventricle. In aortic stenosis the pulsations of the heart and aorta are small. In aortic incompetence as a result of a high pulse pressure, the amplitude is great. X-ray examination also can help in differentiating aortic insufficiency due to syphilis from that due to rheumatism. An aneurysm or out-pouching of the aortic arch speaks in favor of syphilis (Fig. 7 a and b). Syphilis of the aorta without involvement of the aortic valves is practically never a cause of cardiac enlargement.

Hypertension, whether primary or secondary, affects the left ventricle. The degree of enlargement depends on several factors; namely, the height of the diastolic pressure, age, constitutional type, and presence or absence of coronary

disease. In the typical case the left ventricle enlarges in a boot-shaped manner and rather characteristic changes occur in the aortic arch. The aorta becomes uncoiled in that it diffusely dilates and elongates toward the root of the neck. This can be demonstrated in the left oblique view. The effect of this alteration is to increase the size of the aortic window.

Radiology is of invaluable aid in diagnosing congenital anomalies of the aortic arch. Persistent right-sided aortic arch can be diagnosed only by this method. The barium-filled esophagus can be seen to impress the arch on the left side instead of, as it normally does, on the right side, and the concavity of the aortic arch impression is directed to the right. Frequently, complete or partial coarctation of the aorta can be recognized by radioscopy. In this condition, a narrowing of the aortic arch just distal to the subclavian artery can sometimes be demonstrated (Fig. 8). The presence of hypertension in young adults should immediately suggest the possibility of coarctation of the aorta and the classical radioscopy findings which attend it should be sought.

Now that coronary thrombosis is so frequently recognized as a clinical entity, the complications that follow it can be determined with a fairly high degree of accuracy. Thus, formerly the diagnosis of cardiac aneurysm was relegated to the pathologist. It is now possible, by x-ray examination, to visualize the aneurysmal bulge in a fair proportion of cases. The common site for the development of the aneurysm is in the vicinity of the apical portion of the left ventricle for anterior infarction and along the posterior wall with posterior infarction. In both instances these aneurysms are radioscopically visible. We have recently observed an aneurysm of the lower posterior portion of the left ventricle when the patient was placed in the left oblique view. Roentgenological diagnosis of aneurysm of the heart is quite impossible when the lesion develops at the diaphragmatic surface or when it affects a septum. Calcification may occasionally be noted in the wall of the aneurysm.

Left Auricle.—Radiologic examination of the left auricle has contributed greatly not only to the recognition of mitral stenosis but also to a study of its effects on the enlargement of other cardiac chambers. Anatomically, the left auricle is situated entirely on the posterior aspect of the heart. For this reason it just rests against the

esophagus. It is not visible from the front, except a tiny portion of it which is known as the left auricular appendage. It is therefore beyond the reach of percussion.



Fig. 8. Coarctation of the aorta, partial, in female, aged thirty-two, who died of subacute bacterial endocarditis. Outline drawing from teleoradiogram in left oblique view, showing kink-like narrowing of aorta. Considerable dilatation of aorta proximal to site of stenosis. Postmortem control.

According to Assman,¹ the right oblique position (patient facing examiner with right shoulder to screen) with rotation about 70° is the most favorable position because then the retrocardiac space is well shown, being bounded above and below by clear spaces. Parkinson has stated that next to the presystolic murmur, the posterior displacement of the barium filled esophagus is the best evidence for left auricular enlargement in mitral stenosis (Fig. 9a and b). The stages of left auricular enlargement from one of simple enlargement to where it has assumed aneurysmal size and extends into the right chest can be easily demonstrated by radioscopy.

It should be pointed out here, however, that displacement of the esophagus is not pathognomonic of mitral stenosis. Babey² has recently shown, in radioscopy studies confirmed by necropsy findings, that other conditions may displace the esophagus posteriorly. Long standing cases of auricular fibrillation without mitral stenosis eventually lead to left auricular enlargement. In complete heart block the left auricle sometimes becomes quite prominent. A greatly enlarged left ventricle not infrequently can push the left auricle posteriorly. In such cases the barium-filled esophagus convexity in the right oblique position is often long and gradual and not so abrupt or placed so high as in the left auricular enlargement found in mitral stenosis.

Right Auricle.—The right auricle forms the right lower border of the heart and is therefore clearly visible from the front. When enlargement appears on the right side of the heart, it

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should not be inferred that the right auricle is enlarged because lesions responsible for right auricular enlargement are rare. Enlargement in the region of the right auricle should rather in-

recognition of right-sided lesions. In the study of enlargement of the right ventricle it is important to recognize the fact that the outflow tract of the right ventricle represented by the

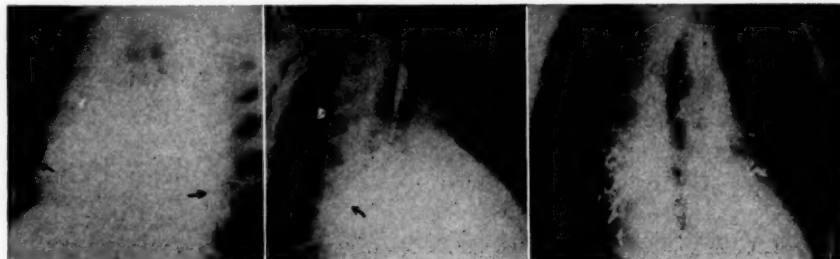


Fig. 9a

Fig. 9b

Fig. 10

Fig. 9. Mitral stenosis and aortic insufficiency, auricular fibrillation in male, aged forty-seven. (a) Left oblique view. Right ventricular enlargement shown anteriorly. Left ventricular enlargement indicated by cardiac shadow projecting into the shadow of the spine. The left bronchus is elevated by an enlarged left auricle. The aortic window is narrowed. (b) Right oblique view. The enlarged left auricle (balloon-like prominence) displaces the barium filled esophagus posteriorly and obliterates the retrocardiac space. Anteriorly, there is considerable prominence of the pulmonary conus. Just below this is noted a bulging of the mass of right ventricle which almost completely obliterates the lower portion of the anterior mediastinal space.

Fig. 10. Teleoradiogram, right oblique view, showing enlargement of the conus region of right ventricle. From case of emphysema. Postmortem control.

dicate displacement of the heart, dextrocardia, enlarged left auricle extending out from behind the right auricle, generalized enlargement of the heart, pericardial effusion or aneurysm of the ascending aorta. These conditions can all be differentiated by radioscopic examination. Lesions affecting the tricuspid valve are rare. However, when tricuspid stenosis does occur, enormous enlargement of the right auricle ensues. In organic tricuspid incompetence or more commonly in relative tricuspid insufficiency, some enlargement of the right auricle is expected. This condition can occasionally be seen in advanced stages of pulmonary disease in which the right heart alone is affected. In congenital defects of the auricular septum, the right auricle is often enlarged to a considerable extent, especially when there is a coexistent congenital mitral stenosis. Rarely, isolated enlargement of the right auricle may be seen in congenital auricular septal defects, in the absence of other congenital anomalies.

It should be further mentioned that longstanding cases of auricular fibrillation will, in time, cause enlargement of both auricles. By studying the radioscopic impressions of the barium-filled esophagus it is possible to differentiate left auricular enlargement from right auricular enlargement.

Right Ventricle.—Radiology has rendered a great service to cardiology in facilitating the

conus is the first to suffer enlargement from whatever may impose a strain on it. Fortunately, conus enlargement can be recognized in its early stages. First evidence of conus enlargement is best seen in the right oblique view with the patient well turned to the left (Fig. 10). In this position one sees a localized outpouching between the shadow of the pulmonary artery and the body of the right ventricle. When the enlargement becomes more pronounced, the conus becomes radioscopically visible on the left border of the heart in the anteroposterior view. With subsequent involvement, the body of the right ventricle becomes implicated and can be recognized best in the left oblique view (Fig. 9a). This is best demonstrated when the patient is turned well to the right (about 60°). Certain right-sided congenital lesions have fairly definite radiological appearances. By correlation of the shape of the heart with the auscultatory findings and the presence or absence of cyanosis it becomes possible to determine the location of the lesion with great accuracy.

Congenital heart lesions should no longer be looked upon as a matter of purely academic interest because, as Maude Abbott has shown, the prognoses in many types of congenital anomalies are extremely favorable. It is, therefore, important to recognize the type of congenital anomaly of the heart before venturing a poor prognosis. Radiology serves to distinguish congenital

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lesions from rheumatic valvular defects, occasionally a difficult task from purely clinical observations. The Tetralogy of Fallot, one of the common causes of cyanosis in congenital heart

looked if one expects to find an increase in the transverse diameter of the heart seen from the front. While the prominence of the conus is more common and exaggerated than enlargement

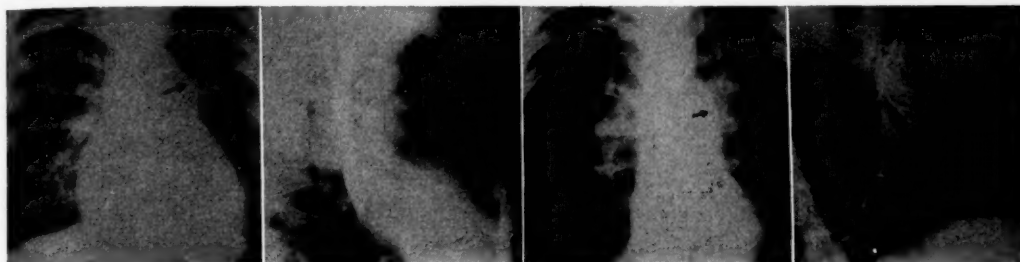


Fig. 11a

Fig. 11b

Fig. 12a

Fig. 12b

Fig. 11. Patent ductus arteriosus in female, aged twenty-two. Blood pressure 140/68. A machinery murmur and thrill in the second left interspace. Second pulmonic sound present. Teleoradiogram: (a) Anterior view: moderate enlargement of entire cardiac silhouette chiefly right ventricular with marked prominence of shadow of pulmonary conus and artery. The aortic knob is small. Left oblique: (illustration omitted). Aortic window obliterated by enlarged pulmonary artery. Marked enlargement anteriorly of body of right ventricle. Pulsations of Hilar vessels noted on radiosopic examination. (b) Right lateral: No left articular enlargement. Filling up of anterior mediastinal space by enlarged right ventricle and conus.

Fig. 12. Emphysema in male, aged forty-two. History of bronchial asthma for twelve years. Teleoradiogram: (a) Anterior view: prominence of pulmonary artery and of both of its branches (hilar vessels). (b) Right oblique view: oval shadow of enlarged pulmonary artery is well shown. Postmortem control.

disease, often gives a characteristic cardiac silhouette, namely a dextroposed aorta, small or normal sized pulmonary artery, and an enlarged right ventricle. Patent ductus arteriosus with a small aorta and dilated pulmonary artery and conus usually offers no difficulty (Fig. 11a and b).

Further contribution of the radiosopic method to the study of cardiac enlargement has recently been submitted by Parkinson and Hoyle¹² in their comprehensive treatise on the heart in emphysema. So convincing is their evidence that one need no longer doubt that the right heart is involved in this disease. In our studies on emphysema heart we have been able to confirm their findings. They have pointed out that cardiac measurements are invalidated because of the excessive width of the chest in emphysema. They further emphasize that the signs of right ventricular enlargement are different and elusive, being not nearly as easy to recognize as the signs of left ventricular enlargement to which physical signs are so largely directed.

Right ventricular enlargement in emphysema is most commonly recognized by the prominence of the conus which may be seen from the front but better yet in the right oblique view (Fig. 10). It has been shown by Kirch⁷ that the far end of the outflow tract of the right ventricle, the conus, suffers first from increased pressure in the pulmonary circulation. The conus first lengthens rather than widens, and this is frequently over-

of the body of the right ventricle, nevertheless, enlargement of the right ventricle can best be seen with the subject rotated in the left oblique position to about 60°, where it forms the anterior border of the silhouette.

Another radiologic feature of emphysema heart is prominence of the pulmonary artery seen from the front (Fig. 12a). Here also, dilatation of its branches can be visualized. Prominence of the main pulmonary stem can be recognized roentgenologically in the two oblique positions (Fig. 12b). In the left oblique the stem and left main branch can be seen as one of the structures lying in the aortic window. Not infrequently the pulmonary artery may become enlarged to entirely obliterate the window. With barium paste, the so-called right pulmonary artery impression can be recognized on the esophagus. In enlargement the pulmonary artery impression becomes exaggerated.

A marked prominence of the pulmonary artery and conus or one of the main branches has often been erroneously interpreted as mediastinal tumor. Pulmonary artery enlargement is commonly observed in certain types of congenital defects: namely, in patent ductus arteriosus; auricular and ventricular septal defects; and in congenital aneurysm of the pulmonary artery or one of its branches. Among the acquired lesions that cause pulmonary artery enlargement are mitral stenosis, especially when associated with pulmonary valve incompetence, congestive fail-

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ure, chiefly of the left ventricular type, and enlargement in the early stages of hyperthyroid heart (Fig. 13a and b). The pulmonary artery is likewise enlarged in pulmonary arteriosclerosis

ease was a rare association and that rheumatic fever was not an etiologic factor. The findings of mitral stenosis ruled out its presence. The cardiac shadow was normal in size in seven,

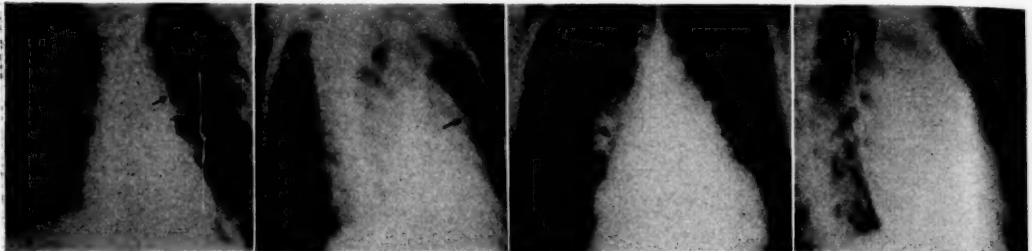


Fig. 13a

Fig. 13b

Fig. 14a

Fig. 14b

Fig. 13. Toxic adenoma in female, aged forty-eight. BMR + 68 per cent. Tachycardia, palpitation, and dyspnea on exertion. First sound at apex booming in character (pseudo-mitral stenosis). Harsh systolic murmur over pulmonic area. Tele-radiogram: (a) Anterior view: Prominence of pulmonic arch. No cardiac enlargement. Radioscopic examination showed hyperactive pulsations along all borders, particularly the pulmonary artery. (b) Right oblique view showing pulmonary artery prominence.

Fig. 14. Pulmonary arteriosclerosis in male, aged thirty-three. Only complaint is dyspnea on moderate exertion. Systolic murmur heard over pulmonic area. No diastolic murmur heard. Second pulmonic sound accentuated. Venous pressure normal. Circulation time: from arm to lung somewhat prolonged, twelve seconds. Circulation time: from lung to tongue normal. In the anterior view, the striking feature on radioscopic examination was the hilar dance (expansile pulsations of pulmonary stem and its branches). The smaller pulmonary vessels out further in the lung fields could also be seen pulsating noticeably. Pulsations at the left lower border of cardiac silhouette is the right ventricle. These pulsations alternate in direction (see-saw movement), with pulmonary arch. Tele-radiogram: (a) Marked enlargement of cardiac silhouette. Chiefly right ventricular enlargement, with prominence of pulmonary arc. Aortic shadow not seen. Pulmonary arterial branches markedly enlarged. (b) Right oblique view: Mass of heart chiefly right ventricle. Left atrium not enlarged. The dense, bandlike shadow (indicated by arrows posteriorly) is the shadow of the dilated right main pulmonary artery. The left oblique illustration is omitted. It showed the aortic window filled out by the pulsating shadow of the pulmonary artery. There was very little, if any, enlargement of the left ventricle posteriorly. Anteriorly, enlargement of the body of the right ventricle was pronounced.

and rarely in syphilis of the pulmonary artery. The so-called hilar dance and pulsations of the pulmonary vessels are irrefutable evidence of pulmonary artery enlargement (Fig. 14). By radioscopy it is possible to distinguish cardiac enlargement from pathological conditions in the mediastinum or in the surrounding structures that may simulate cardiac enlargement, such as mediastinal masses, lung tumors, and spinal cord tumors. Differentiation is made possible by rotating the patient behind the fluoroscopic screen. In this manner extra-cardiac shadows can be separated from the silhouette of the heart.

Constrictive pericarditis.—There is one type of chronic heart disease in which surgery is unquestionably indicated and when carried out successfully leads to dramatic recovery. I am referring to chronic constrictive pericarditis, fifteen cases of which were reported by Paul White¹⁵ in the St. Cyres lectures in 1936. He described the condition as one of a state of congestion without cardiac failure, which was brought about by a thick, rigid wall of pericardium surrounding the heart and the great vessels, in this manner embarrassing its action and mechanically obstructing the inflow of blood.

In discussion of his cases, he stated heart dis-

slightly enlarged in five, and moderately enlarged in three cases. In the case of constrictive pericarditis that we have recently studied the heart was normal in size. The clinical manifestations of chronic cardiac compression are distended cervical veins, cyanosis, ascites, enlargement of the liver, edema and hydrothorax, pulsus paradoxus, small pulse and low pulse pressure. However, before decortication of the heart is attempted, the clinician must make doubly sure that the constrictive phenomena exist. The opportunity to confirm the clinical findings is made possible by radioscopic examination. In this condition we usually see a normal sized heart which is fixed in position. The striking feature is that the heart is immobile. The act of respiration does not alter its size nor shape. Frequently, no pulsations of its borders can be discerned. If pulsations are present, they are markedly impaired and localized either to the right or left side of the heart. Occasionally, areas of calcification can be visualized in the thickened pericardium. The results reported by Churchill⁴ and Beck³ after performing pericardial resection are indeed striking and stand out among the great achievements of modern surgery of the heart.

Time will not permit me to discuss any fur-

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ther the usefulness of radioscopy to clinical cardiology. The clinician who has the radioscopic method at his disposal is equipped with a diagnostic facility equal to if not greater in importance than the electrocardiogram. Briefly, the radioscopic method gives us the following information. It replaces percussion and palpation because it gives the extent of cardiac enlargement with a much higher degree of accuracy. By the radioscopic method it is possible to determine slight changes in heart size and to distinguish whether, in doubtful cases, the heart is normal or enlarged. While it is possible that the cardiac silhouette is sometimes less informative than auscultation, as, for example, in early cases of mitral stenosis, aortic insufficiency and certain congenital defects, it gives us superior information regarding prognosis. Other things remaining equal, the smaller the cardiac silhouette, the better the prognosis. By the radioscopic method it is possible to recognize alterations in the shape of the heart. These alterations in shape inform us as to which chambers are involved, and to what extent, and give us a clue as to the etiologic basis for enlargement.

In conclusion, I would like to quote Dr. John Parkinson,¹⁰ who comments about the present and future status of radiocardiography:

"Radiology can contribute to direct and exact knowledge in almost every variety of cardiac disease. . . . Though some will doubtless exaggerate its importance, it will steadily find its proper level among modern

means of diagnosis. It is natural to regard with suspicion anything unfamiliar, and it is our duty to scrutinize any new method; but let not this defer our acquaintance with radiology of the heart—a novelty no longer. The modern physician will have his diagnostic powers extended and refined by adding radiology to his scheme of examination; he will supplement traditional methods by direct inspection of the internal organs. . . . Cardiology is now an important and integral branch of general medicine, nothing more and nothing less. It will advance and develop beyond a post-mortem pathology which is static. By radiocardiography we shall reach a more vital anatomy and physiology, and—earlier in disease—a dynamic pathology of the living heart."

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CONGENITAL SYPHILIS*

Analysis of the Problem in Minnesota

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RECENT interest in the prevention and control of syphilis should be accompanied by increased attention to congenital syphilis because it is a phase of the disease entirely controllable by prophylactic measures. Preventive therapy is almost uniformly successful after the early recognition of maternal syphilis by routine serologic studies of pregnant women. Since these preventive measures are not of recent development but have been recognized for twenty years, one may well inquire why additional cases of congenital syphilis are continually seen.

Although congenital syphilis is not a major public health problem in Minnesota it is interesting to note that over a ten-year period there is no appreciable change in the number of reported cases of this disease†

1927.....	125	1932.....	105
1928.....	67	1933.....	151
1929.....	103	1934.....	131
1930.....	163	1935.....	122
1931.....	134	1936.....	105
1927-1931—592		1932-1936—614	

The statistics for the two five-year periods are perhaps not comparable inasmuch as the profes-

*From the Division of Dermatology, University of Minnesota Medical School, Dr. H. E. Michelson, Director.

†Figures obtained by courtesy of Dr. O. McDaniel, Minnesota State Board of Health.

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sion has been more alert in recognizing syphilis in recent years and much more prone to report new cases to the State Board of Health. It is possible that there has been an actual decrease in the incidence of congenital syphilis.

It was thought that analysis of the new cases recently observed at the University and Ancker Hospitals might disclose the reasons for the continued occurrence of congenital syphilis and point out a course to follow in future attempts to prevent this disease. During a period of two years a total of thirty-seven congenital syphilitics made their first visit to these two clinics. An additional fourteen patients were included in the study because they presented manifestations of active syphilitic infection during this period although the diagnosis had been made in previous years. In approximately one-third of the total cases, the physician or agency referring the patient to the clinic had already established the diagnosis.

	Univ.	Ancker Hosp.	Total
Cases studied	26	25	51
New cases in two-year period	21	16	37
Diagnosis known before admission	9	9	18 (35%)

Since the symptoms of congenital syphilis are well known the clinical investigation of this series was limited to a simple classification. The patients classed as suffering from early signs of congenital syphilis included examples of snuffles, rhagades, osteochondritis and cutaneous eruptions. It is unfortunate that in so many as twenty-two cases the disease was not recognized until the development of neurosyphilis or interstitial keratitis, conditions where treatment seldom returns the tissues to completely normal function.

	Univ.	Ancker Hosp.	Total
Clinical manifestations			
Early	5	7	12 (24%)
Asymptomatic	12	5	17 (33%)
Interstitial keratitis	5	7	12 (24%)
Neurosyphilis	5	8	13 (26%)
(Three children had both keratitis and neurosyphilis)			

The relatively large number of children showing no clinical evidence of congenital syphilis is evidence of some progress toward lessening the damage resulting from this disease. Only a few of these children were referred to the clinic as a result of routine serologic studies. Most of them were members of families where the diagnosis of syphilis had been made on another in-

dividual a short time before. The entire family was then investigated and in the case of these children the disease was recognized before serious pathologic changes had taken place. It is unfortunate that a still larger number of cases could not have been recognized while the infection was still asymptomatic.

In the case of syphilis as with most other infections the chance for cure is much greater when the infection is recognized early. In an attempt to determine the amount of time lost before proper diagnosis, these patients were grouped according to their ages at the time of diagnosis. In nearly half the group the children were of school age before the disease was recognized.

	Univ.	Ancker Hosp.	Total
Age at time of diagnosis			
Under 6 months	8	8	16 (32%)
6 months to 6 years	6	5	11 (22%)
6 years to 10 years	7	4	11 (22%)
Over 10 years	5	7	12 (24%)

Congenital syphilis presents a minor problem in Minnesota in comparison with many other communities, but in spite of the relatively favorable nature of the local situation thirty-seven new cases of this preventable disease have been observed at Ancker and University Hospitals within a two-year period. As it is unreasonable to expect complete eradication of congenital syphilis or any infectious disease, the question arises whether its incidence has reached an irreducible minimum in Minnesota. In the light of experience elsewhere, particularly in the Scandinavian countries, this question must be answered in the negative.

This state has been fortunate in the efforts of the State Board of Health in the control of syphilis and in the manner in which the public clinics have performed serologic tests on all pregnant women. The dermatologic and obstetric clinicians at the Medical School have taught for many years that every pregnant woman, whether in a clinic or under private care, should have a Wassermann test early in each pregnancy. The failure of many physicians to perform such tests is certainly not due to ignorance of their value but rather to discouragement after performing large numbers of such tests with only negative results. Nearly all physicians have known that intensive specific treatment is urgent after recognition of syphilis in pregnancy. Con-

CONGENITAL SYPHILIS—LYNCH

genital syphilis is being observed in spite of this knowledge and must be regarded as a problem deserving further attention.

In the case of prevention of congenital syphilis, as in all medical advances, there has been a period of time, a lag, between the scientific discovery and its universal acceptance and application. To a certain extent such delay is inevitable, but every effort should be made to reduce it to a minimum. It was thought that study of the individual histories of these fifty cases of congenital syphilis might disclose information as to the cause of this "lag" and point out a course to follow in future efforts against the disease.

With reference to congenital syphilis the education of the medical profession has not been as successful as might be desired. It is evident that routine serologic study in pregnancy would result in almost entire prevention of the congenital infection but it is not clear in this group of cases how often the lack of this study was the fault of the attending physician. In one case, however, the presence of syphilis was demonstrated in the seventh month of pregnancy, yet the physician determined to "defer treatment until termination of the pregnancy" and a congenital syphilitic child was born. Another woman having neurosyphilis was admitted to a third hospital early in pregnancy. Although she was an inmate of this institution throughout her pregnancy, no specific therapy was given and a syphilitic child was born.

The physician has an added responsibility to avoid delay in diagnosis after the birth of the child. One infant suffered early from convulsions and at the same time presented a cutaneous eruption, yet the diagnosis was delayed until the child was seven months of age. A seven year old child gave a history of "sore eyes" since infancy but the cause was not recognized until after the development of neurosyphilis. A sixteen year old child had "always been sick" and the father was known to have syphilis but interstitial keratitis developed before the disease was recognized.

One woman had previously received inadequate treatment for syphilis yet no serologic study or antiluetic treatment was ordered during her pregnancy. Her child was sickly for the first few weeks and then failed to gain weight while the disease progressed until the child was admitted to the hospital at three months of age.

In this case treatment had been delayed too long and the child died a few days later.

These instances are all evidence of the need for further education of the profession in the available scientific knowledge. Another example of professional failure occurred in an institution which requires Wassermann studies on all women delivered. In this case, although the test was probably performed, no report was recorded, since the patient's laboratory sheet was misfiled. Several months later the child returned with congenital syphilis and the oversight was noted. An occasional error of this nature is probably to be expected though not to be excused.

A second reason for "lag" in the application of medical knowledge is the time required for education of the public. It is evident that continued effort is necessary to persuade women to report to their physicians in the first few months of pregnancy. If maternal syphilis is recognized this early, the proper treatment is almost always successful in preventing congenital syphilis. The present extensive publicity campaign against syphilis may overcome some of the objections of women to submitting themselves to routine Wassermann studies in private practice.

Every syphilitic woman when starting treatment should be told of the importance of regular therapy during pregnancy and should be made to realize the necessity of notifying her physician early in subsequent pregnancies. Her Wassermann test may then be negative due to previous treatment, yet further treatment is indicated for prevention of infection of the child although the mother herself might not otherwise require this treatment. In several instances in this series the mother knew of her infection yet received little or no treatment during pregnancy.

Since a certain element in the population will never accept responsibility in matters of health, whether individual, family or public, it is evident that education without control will not be sufficient. It is particularly in these cases that public health workers must be interested and active.

Recognition of this public responsibility leads to study of the third cause for "lag" in the attempts at control of congenital syphilis. In many cases in this series the available social service or public health facilities were inadequate. It is to the credit of these workers that many of the cases of congenital syphilis were

brought to the clinics while the infection was asymptomatic or latent. Most of these asymptomatic patients represent brothers and sisters of previously recognized cases of congenital syphilis, or children of women in whom the disease was recognized long after pregnancy. The State Board of Control must also be credited with recognition of the disease before it was clinically evident in four of these children who were submitted for examination as candidates for adoption.

The following cases from this series are cited as examples of failure of social workers or public health authorities. In one case of interstitial keratitis and another with neurosyphilis, the mothers had been under treatment for syphilis for one year before the children were brought to the clinic for examination. In another case there was a similar delay but the consequences were less serious as the child suffered only from iritis. In one case of interstitial keratitis, four years were allowed to elapse between recognition of the disease and institution of treatment. In the interim an extensive cutaneous gumma developed. In the case of a very young infant, four months were lost after reference of the patient from the pediatric to the dermatology clinic before he reported for treatment. One unfortunate youngster developed interstitial keratitis six weeks after admission to the clinic. He was awaiting the completion of arrangements for his treatment. A child referred from the University Hospital to Ancker Hospital returned to the original clinic a year later without having reported at the Ancker Hospital. Neurosyphilis had been allowed to progress during this period of unnecessary delay.

The difficulty of placing on a single person or service the responsibility for the development and unrecognized progression of congenital syphilis is well indicated in the following history. A woman first seen in the clinic in July, 1933, was treated for gonorrhea but no serologic tests for syphilis were performed. She returned to the obstetric clinic two years later, when routine studies showed a positive Wassermann reaction but treatment was not instituted until seven weeks after her admission to a pre-natal clinic. The child was apparently normal at birth but was taken six weeks later to another hospital where clinical, serologic and roentgen studies

showed him to be syphilitic and he was referred back to the original clinic for treatment.

Summary

Though only thirty-seven new cases of congenital syphilis have been observed in two years in the University and Ancker hospitals, it is evident that many of these could have been prevented. The scientific background for such prophylaxis is well established.

In this study an attempt has been made to determine the reason for failure of these preventive measures and in many of these cases it has been possible to place the responsibility for this failure. The examples which have been cited serve to show that future attempts toward the control of congenital syphilis require greater interest on the part of the medical profession and the provision of more adequate social service and health department facilities. Education of the general public appears to be a minor factor in the prevention of congenital syphilis.

The following procedures are suggested as methods for the prevention of congenital syphilis and its serious effects on the child:

1. *Every woman with gonorrhea should have a Wassermann test in order to recognize early many cases of syphilis which are now passing unrecognized.*

2. *Every syphilitic woman should receive adequate treatment but should also be warned of the need to report to her physician early in any subsequent pregnancy and inform him of her syphilitic status.* (A woman who has once had syphilis usually requires treatment throughout each pregnancy. Patients whose disease is of more than eight years' duration and who have received "adequate" treatment previous to the pregnancy may be exceptions to this rule.)

3. *Every pregnant woman should have a Wassermann test early in pregnancy.*

4. *After the diagnosis of syphilis is made during pregnancy, treatment should be intensive.* (If it is started in the third or fourth month and at least ten arsenical and ten heavy metal injections are given, a normal child may be expected. The dosage of the drugs and the division into courses are matters for individual arrangement.)

5. *At the time of delivery a Wassermann test should be performed on the maternal blood or the "cord" blood in every case.* (Collection of blood from the severed cord is a simple method

for determination of the serologic status of the mother only. Since the child's serologic identity is not established until several weeks after birth, a Wassermann test on cord blood does not prove the presence or absence of congenital syphilis. A positive Wassermann reaction on the cord blood, or the maternal blood, aids recognition of those cases in which syphilis has been acquired subsequent to the Wassermann tests performed earlier in pregnancy. Additional clinical, roent-

genologic and serologic studies will establish the status of the child.)

If the medical profession were to follow these rules, even allowing for some lack of coöperation on the part of the patient, congenital syphilis could be practically eliminated in Minnesota. In the few cases where it might develop, the disease would be recognized and treated before irreparable damage was done.

PERSONAL SURGICAL OBSERVATIONS*

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I WISH to present tonight a few observations on surgery in general as practiced by an average surgeon in a small hospital, and at the same time to report a few cases, each of which will, I hope, bring home some practical point.

It is my firm belief that those of us who practice in the smaller communities and institutions often give our patients closer individual service and attention and hence obtain better results than may be obtained in larger and better advertised surgical centers. In the larger centers the surgeon is likely to do less and less for the patient aside from the operation. Unless grave emergencies arise, the surgeon sometimes never sees the patient either before or after he meets him at the operating table, the operation often having been arranged for by the house staff alone. This is an additional wrong.

The closeness of personal contact between patient and surgeon so pleasant and profitable to both, which once prevailed even among busy surgeons in large centers has been largely disrupted, to the loss of both. The surgeon gains a little leisure and saves some wear and tear. The patient loses the solace and comfort he has a right to expect. *The two do not balance!!*

My personal opinion is that the operation itself is the least important to the patient's welfare, the preoperative and postoperative care far outweighing in benefit to the patient the actual technic.

*From the Itasca Clinic. Read before the Itasca Hospital Staff, Grand Rapids, Minnesota, September 2, 1937, and before the Range Medical Society, Virginia, Minnesota, October 19, 1937.

Preoperative Care

I shall dwell but a few moments upon this feature.

1. Patients who face any major surgical procedure are entitled to and should receive a full and careful physical check-up in the home or office before ever arriving at the hospital.

Any and every abnormality revealed or even suspected from the history or examination should be carefully checked into, and, if possible, remedied before the patient goes to the hospital.

I vividly recall a patient seen by two of us who suffered from recurrent attacks of angina pectoris. We had seen him in several attacks and had treated him and brought him out. The man was not satisfied and went away to a large Clinic. The Clinic got an indifferent history, gave the man a routine check, told him he had gallstones, and diagnosed his previous spells as gallstone colic. The man had his gallbladder removed (fortunately did not have an angina spell while in the hospital) and returned home only to have another angina spell in which he died. In my mind, the operation contributed to his untimely end. A thorough check-up with full history and coöperation between that Clinic and the home doctors would have been of considerable value.

2. The patient's chief resources on entering the operating room are his constitutional powers and his resistance, reinforced by cheery bravery; and all that can be done to increase these should be done. I have in mind two specific cases in which death postoperatively occurred partly, at least, because of lack of reserve.

One case was a woman who had been for some

time on a self-imposed restricted diet on which she lost twenty-five pounds from a normal weight of 160 pounds. She thought this would cure her gallbladder attacks and increase her beauty. Operation became imperative because of rapidly recurring attacks of colic and intractable vomiting, but the woman just faded out of the picture postoperatively because of lack of stamina.

A second patient, a strong, able-bodied and apparently robust young woman, was run down, however, from five pregnancies, the care of a large family and repeated gallbladder colic. Her examination revealed no really great physical handicap. After thirty-six hours in the hospital, during which time she rested well and was well checked, her gallbladder was removed. Thirty-six hours after the operation she developed a cardiac failure and died.

In both of these cases, a preliminary period of preparation with rest and general care might have spelled a different final result. It is unnecessary to go into great detail but there are a number of conditions such as anemia, jaundice, elevated blood pressure, obesity and alcoholism which require preliminary treatment prior to operative procedures.

3. Hospitalization for at least twenty-four hours prior to all major operations gives the patient a chance to become accustomed to new surroundings, nurses, attendants and hospital procedure. It further gives the sincere surgeon a chance to gain the patient's additional confidence and allay nervous misgivings. The pre-anesthetic preparation too can be performed in a more thorough and leisurely manner. This will all contribute to a better final result and it is our experience that a quiet day or two in the hospital before a major operation is *not* an additional expense because it will reduce the postoperative hospitalization a corresponding amount.

Let me say also that the old-time habit of giving laxatives preoperatively is a vicious practice. Unless the operation is for hemorrhoids or extensive perineal work, I can see no justification for causing the patient the fatigue of a day's diarrhea with its accompanying cramps, its tendency to produce gas pains and distress on succeeding days, and, above all, its dehydration, which is the very thing every surgeon should avoid. How utterly silly it is to give a purge which dehydrates and then intravenous fluid just

before or after operation to counteract dehydration. One has only to recall many appendectomies done without even a preliminary enema, which have resulted successfully, to understand the foolishness of this practice.

4. Every surgeon has his own pet theory about anesthetics and the preparation therefor. I shall not attempt to discuss any. Suffice it to say that once a regular routine has been tried and proven, it should be carried through in all cases and a surgeon in a small community has no right to attempt to make guinea pigs out of his patients with a lot of untried or half proven new drugs which some irresponsible agent tries to sell him.

So much for preoperative care.

Postoperative Complications and their Treatment

I quote:

"Many a well-fought surgical battle, won on the operating table, is needlessly lost in the convalescent room. The surgeon should personally attend to postoperative directions. There is too great a tendency to operate and get out—rather than operate and stay about.

"Many a cleverly performed operation has passed into death through faulty and inefficient after-treatment—while many a desperate and apparently hopeless operation has gone into brilliant recovery through after-treatment skill and efficiency. A patient may be put upon the road to recovery by operation—but unless he be wisely guided along that road, the operation may be unavailing. Even a bungled operation with a safe, speedy convalescence and satisfactory outcome, is more, far, to the patient than the cleverest operative technic followed by a long, painful, or hazardous, convalescence, and with an imperfect result.

"The surgeon's work and responsibility are only partly done when he has finished operating. Often much more judgment, and higher and broader surgical qualifications, are needed in the early recognition of conditions following operations, and in the after-guidance of those conditions to safety and full function, than was ever demanded in the mere operative technic. The surgeon who is an excellent operator but an indifferent postoperative fighter will probably lose more patients than the indifferent operator who is a hard and efficient postoperative fighter."*

The patient on return from the operating room and following recovery from the anesthetic should be allowed every possible freedom of position consistent with comfort. A pillow under the knees renders the abdomen less rigid and hence more comfortable. The postoperative nausea and vomiting are seldom prolonged and

*Bickham, Warren S.: *Operative Surgery*, Philadelphia: W. B. Saunders Company, 1924. Volume I, page 289.

as a rule take care of themselves or the cause is apparent and the condition corrected by simple means. One very common postoperative error is wrapping the patient too warmly and causing excessive dehydration by sweating. Where possible, the patient should not be allowed to sweat excessively either on the operating table or after return to bed. What possible excuse can there be for proctoclysis, hypodermoclysis and intravenous therapy to restore the fluid balance if we at the same time permit dehydration by a hot pack of wool blankets and hot water bags?

I am happy to note also that, with the exception of operations on the stomach and duodenum, the patient is today allowed to have fluids practically *ad lib.* following operation. I feel that many cases of gas pains and general distress can be completely avoided if the patient is encouraged to take nourishment in moderate amounts following almost all operations where the anesthetic has not caused unfavorable reaction.

Postoperative pain should be absolutely controlled for two or three days by large enough doses of an opiate to really do some good. Postoperative bleeding should always be investigated and the cause removed. Postoperative shock should not occur if the patient has been properly prepared and the operative procedure is within the physical strength of the patient. I believe no surgeon should plan to operate longer than two hours at any one stage. The patient just is not made to stand that prolonged shock to the nervous system under any type of anesthesia. If shock does occur, it must be combated with every device at the surgeon's command.

The major postoperative complications which I wish to discuss and illustrate with case reports are:

1. Pulmonary embolism.
2. Acute gastric dilatation (gastric paresis).
3. Obstruction.
4. Paresis and paralysis of the bowel.

Pulmonary Embolism.—This frightful specter rears its ugly head following surgical procedure every so often. There is no proven cause for it and no known prophylaxis or treatment. My single case is:

A woman, forty-six years of age, a hard-working farmer's wife, had for a good many years suffered from a large adenomatous goiter and recurrent gall-

bladder attacks. About three years before she had come to the hospital for cholecystectomy she had shown signs of marked hyperthyroidism. She refused treatment and allowed the toxins to do their damage for two years before she finally went to the University Hospital, where a successful thyroidectomy was done.

Her gallbladder symptoms had started to be more severe and frequent about the same time but we waited a year before suggesting gallbladder surgery. The gallbladder was readily removed and the patient convalesced satisfactorily although she was nervous and somewhat apprehensive. On the morning of the fourth day, the patient remarked to the nurse that she felt "better than she ever felt in her life." She requested a bed pan. The nurse got one, returned, helped her on the pan only to have the patient collapse and die in a few seconds.

Ingleby says of this condition:

"The patient who may be convalescing from an operation or apparently in good health suddenly becomes dyspneic and cyanosed. Death may be practically instantaneous. Survival is rarely as long as 10 minutes."

Inasmuch as we know of no prophylaxis and no treatment, the case is reported merely as one reason why a surgeon should always give a guarded prognosis and keep the back door open for a rapid run to cover in the face of such rare but always possible eventualities.

Postoperative Acute Gastric Dilatation.—This condition is also rare but its occurrence is frequent enough and serious enough to demand the most active measures for relief without which death usually occurs within twenty-four to forty-eight hours. It occurs in the second twenty-four hours following operation and it should be especially remembered that it may occur in connection with extra-abdominal as well as intra-abdominal operations. It has also been encountered in connection with various non-surgical conditions such as pneumonia and typhoid fever. Its cause is unfortunately not definitely known, but it appears that an atonic state of the stomach and overfilling of the organ with food or fluid play a part. Toxemia, an unusually long mesentery, duodenal obstruction and the like, have also been blamed.

A case in point was that of a young man of twenty-five years who, on August 4, 1937, at 5 a. m., left Nashwauk for the Twin Cities. On the way down, he became ill with considerable abdominal distress, nausea and protracted vomiting. In spite of his illness he completed his business in the Twin Cities and then drove home via Duluth and the trip home took fourteen hours, much of the time being spent vomiting by the roadside. He arrived home at 2 a. m. but did not

see any physician till 4 p. m., August 5 when we admitted him to the hospital. He had a ruptured appendix. He was operated at once, the wound being closed with drainage.

The first twenty-four hours postoperative were very quiet and seemed normal. At 7 p. m., twenty-seven hours after the operation, he suddenly began to be distressed. His lips and fingernails became cyanotic, his pulse increased rapidly in rate and became irregular, his breath came in short apparently painful gasps. There was not much apparent distension but the epigastrium became markedly tympanitic. A rectal tube brought a little gas but no relief. He did not and could not vomit. He could not void. There was a small amount of purulent drainage from the wound. His lungs, because of heart failure, started to fill with mucus and secretions, and he had the so-called death rattle. His condition became alarming by 10:30 p. m. Many attempts to introduce the nasal suction tube were not successful. We then decided to try the large stomach tube. This failed to go down and so embarrassed the patient that he almost expired.

Because of our inability to get suction started in the orthodox manner, the patient was turned and placed in knee-chest position with several pillows under the hips, the face out over the edge of the bed. In this position, we got our tube down and got results. The patient showed considerable improvement. Nasal suction was continued for two days. Digitalis was given for the heart. Enemas and rectal tube produced results, proving that we had no intestinal paresis. Intravenous fluids were given repeatedly.

During the third postoperative day, the pulse fell rapidly and the boy proceeded to make an uneventful recovery.

Postoperative Obstruction.—I shall here consider only mechanical obstruction and consider paresis separately. Mechanical obstruction seldom occurs immediately after operation. Our cases have been seen months following operation.

One such case was that of a young man seen in June, 1933, with an appendix which had been ruptured several hours. He was very ill. Decision was made to operate and establish drainage. The appendix was not looked for but the drainage was established, the bowels mopped up and 300 c.c. of normal saline left in the abdomen. He had a stormy convalescence but left the hospital on the twelfth day.

Subsequently, he had several minor and one major spell with obstructive symptoms. The administration of mineral oils helped him, but on January 24, 1934, seven months after the operation, he came back to the hospital acutely ill, greatly distended, vomiting profusely and in great pain. Enemas and nasal suction were of no avail so an operation was performed. The ileocecal junction was found bound down tightly and the small bowel obstructed just where it emptied into the cecum. Adhesions in the entire area were dissected away and a search made for the appendix but none was

found. The lower end of the cecum seemed normal. The patient made a normal recovery and has had no trouble since.

In this case we know that the adhesions were the result of previous suppuration in the right lower quadrant. The resulting scar tissue finally closed off the small bowel. These postoperative obstructive cases ordinarily do well but it is important not to delay operation in the presence of an acute attack.

I believe that, where the patient's condition justifies it, it is good procedure to check for unnatural or unusual bowel adhesions at time of any operation in the lower right quadrant and to free such bands as may be found. Those patients who return after appendectomy and tell you that the operation did no good and in whom you can figure no definite pathology, are, I believe, cases in which the operation failed to release some of these obstructive bands.

Postoperative Paresis or Paralysis of the Bowel.—I turn now to consider this condition, which I regard as the most common serious postoperative abdominal complication. It occurs at times in individuals where there is neither excuse nor apparent cause for it. Simple abdominal surgery, with a minimum of handling of the bowel, may be followed by almost irreparable paresis, whereas a surgeon may check the viscera from one end to the other, perform an extensive operation and find the patient recovers without a gas pain.

The possible causes of accumulation of gas are: (1) excessive fermentation in bowel; (2) swallowed air; (3) arrested or modified intestinal peristalsis; (4) abdominal contraction; (5) relaxation of sphincters.

The distention from gas may become so great that a partial intestinal paresis may soon be converted into a total intestinal paralysis resulting in a distended inert tube. This may be further aggravated by mechanical obstruction occurring, in certain regions, through angulations due to its own overdistention.

No surgeon of any experience has failed to see this dreaded complication, and no surgeon who has seen it can fail to appreciate its serious possibilities. If there is any condition which calls for more patient, painstaking and prolonged effort on the part of the surgeon, I do not know what it is.

Until the last few years, the best weapon we

had to combat this complication was the colonic irrigation *properly carried out*. These last three words are important because the procedure requires anywhere from one-half to three hours, needs six to ten gallons of warm water and must be done patiently, gently, perseveringly, yet skillfully. The warm solution must play through the entire large gut persistently to help set up a normal peristalsis and often not till many gallons of water and much time has been consumed will the manipulator be rewarded by a gaseous return which spells success.

The above measure is as useful today as it ever was, but we now have a reliable ally in the Wangenstein nasal suction. When instituted early and run steadily over a period of many hours or days even, it can bring back normal function to a gut which otherwise would have remained completely paralyzed. I would recommend that both may well be used on any and every case which assumes serious proportions. The fact is that the surgeon might be better off if nasal suction was established as a routine procedure during the second and third day postoperatively in all extensive laparotomies. I confess that at present I am undecided whether forced feeding and plenty of agarmulsion will keep down gas formation and prevent distention in a large percentage of cases or whether on the other hand the liquid diet may better be used along with nasal suction. In some cases, results have indicated that whichever method was used was not the best. At the present time, we are attempting to use the forced feeding agarmulsion plan in routine cases. However, when our best judgment gives reason to expect impending trouble because of the serious nature of a particular case we use the liquid diet and commence nasal suction early. Each procedure is of definite value in properly selected cases.

In extreme cases, the combined nasal suction and colonic irrigation cannot return peristaltic action to the distended and paralyzed bowel. If paralysis persists for some time, the last resource is an enterostomy. I wish to report such a case.

A man, aged forty-eight, was admitted to the hospital May 19, 1934, a few minutes after being first seen by me at my home. He had been ill three days. Pain had been severe on the first day, let up a while on the second, and then returned even worse on the third day. His abdomen was very distended and rigid, his temperature 102, pulse 100, respiration twenty-four. He was operated upon at once and a gangrenous ruptured appendix with abscess of the tip was removed and tubes

inserted without breaking down adhesions. The adjacent bowel was badly inflamed.

His recovery was stormy during the first six days. Enemas were very successful but little gas was obtained on nasal suction. Purulent drainage from the wound was considerable. The drainage tubes were removed on the seventh day and pus was pouring from the wound. Temperature and pulse had returned to normal. He began to become uncomfortable on the eighth postoperative day and on the ninth was much distended, vomited and his pulse rate was elevated. Nasal suction and enemas were both used with some success and both gave some relief. He was given two or more normal saline solutions with glucose intravenously each day to keep up his strength.

This routine was repeated for seven days and nights from the ninth to the sixteenth postoperative day without success. Then the abdomen was opened by a left rectus incision and a catheter was placed in a loop of the greatly distended jejunum.

We continued nasal suction and irrigations but now were able to drain out large amounts of liquid bowel content through the enterostomy opening. The battle continued until the twenty-first postoperative day, when fecal movement started per rectum, and on the twenty-second postoperative day suction was discontinued and the man took nourishment per os and held it. On the twenty-seventh postoperative day, we removed the enterostomy tube. Fecal drainage from the wound continued profusely, but on the thirty-fourth day, we strapped the wound with adhesive and the drainage lessened. He left the hospital on the forty-second day in good condition; the fecal fistula closed itself after he left the hospital. His recovery was rapid and he has had no abdominal trouble since.

This case is reported in order to demonstrate that no case should be regarded as too desperate. This man got to the cyanosis and death-rattle stage on different occasions. He was obviously about to die many times, but a dogged persistence for well over a month on the part of both surgeon and nurses was finally rewarded with success.

Let me repeat, therefore, that this type of abdominal complication is one which can today be handled successfully with the various mechanical measures at hand, but it requires the undivided attention of an interested and persistent surgeon who personally follows every symptom and treatment in detail.

Conclusions

I have attempted to bring out nothing spectacular or new, but merely to emphasize the importance of: (1) adequate preoperative examination and preparation; (2) postoperative vigilance, watching for symptoms of complications; (3) persistent treatment of all complications which may arise.

THE ETIOLOGY OF CHOREA*

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SINCE we are to speak of Sydenham's chorea we should begin with Sydenham. His paper "On the Dance of St. Vitus" is really a very modest affair. Freely translated the opening paragraph would run about as follows:

"This is really a sort of convulsion. It affects boys and girls from the tenth year to puberty. It manifests itself with a lameness or weakness of one or the other leg so that the weaker member drags itself along behind in a semi-paralyzed manner. The hand of that side if applied to the breast or some other part is unable to remain in that same position even for a moment but is twisted around to another position by a convulsive movement—whichever way the weaker member is drawn. Before the cup can be placed to the mouth he exhibits a thousand gestures, circular in type; for he cannot move in a straight line to his mouth but his hand is turned aside by spasm and he twists it hither and yon until, at length, by mere chance placing the drink properly to his lips, he throws it suddenly into his mouth and eagerly drinks it,—accomplishing the act in such a way that all onlookers are moved to laughter."

The rest of the article is interesting, but I shall forego transcribing it. It is concerned mostly with therapy. Nowhere is there any suggestion of etiology unless we consider such, the reference to the age of the patients.

From the time of Bright, however, the close association of chorea with rheumatism was taken for granted. It is so taken today. Nevertheless Osler, in his masterly monograph on this subject, while not exactly challenging the assumption, showed that the connection was often difficult to demonstrate, stating that only 21 per cent in his series showed a close association. He did state, however, that there is no known disease which, at autopsy, shows such a large percentage of cardiac defects. Since that time there has been much discussion as to the relation of rheumatism and chorea.

Steiner stated that he could find only four cases of articular rheumatism in 252 cases of chorea. Coburn and Moore note that chorea frequently occurs without clinical or laboratory signs of rheumatic activity and that many patients develop no rheumatic stigmata even after

repeated attacks of chorea. They state that the cases of so-called "pure chorea" will run from 30 to 50 per cent. Other writers express similar views.

Then, in 1935, J. R. Gerstley wrote a challenging paper in which he concluded that chorea should be looked upon not as a disease but as a syndrome developing in a child predisposed by heredity and constitution, after psychic exhaustion or infection. He draws attention to the importance of wretched home conditions, domestic crises and inadequate diets. He thinks that there is a distinct chorea temperament to be noted in certain intelligent, over-stimulated and markedly introverted children. He noted again the evident relation of the disease to puberty and suggests that the endocrine glands must be closely concerned. "Rheumatism is a concomitant, not a cause."

This is a pregnant sentence. Nevertheless, we shall ignore its implications for the present and ask ourselves what percentage of cases with chorea ultimately present clinical evidence of chronic valvular heart disease.

Pfaundler and Schlossman answer that ultimately one-half of all choreic cases will present such evidence. Abt says that 32 per cent of his cases showed "cardiac complications." Jones and Bland in their scholarly analysis of 482 cases of chorea state that with observation extending over an eight year period 54 per cent showed rheumatic heart disease. When rheumatism alone was present this percentage of endocarditis rose to 86 per cent and they make this striking statement: "Rheumatic heart disease is less likely to occur when chorea is part of the syndrome."

Of course, in the relatively few cases coming to autopsy, marked cardiac changes are uniformly found. I quoted Osler's striking statement in this connection. Fagge found cardiac disease in seventeen out of eighteen autopsies.

Now, practically all recent writers admit that there are cases of what we shall call "pure chorea." Jones and Bland place the percentage at 28 and say that in these cases, even over an eight year period, no frank evidence of rheumatic

*Read before St. Mary's Hospital Staff, Duluth, Minnesota, November 4, 1937.

fever could be found. However, Schwartz and Leader studied carefully seventy-five cases of pure chorea and observed them from one to twelve years. They state decisively that after seven or eight years one hundred per cent seemed to show cardiac involvement. They ask: Is it true of chorea, as of rheumatism, that the heart is always involved?

Of course, we are hampered by the fact that the etiological agent of rheumatism is still "sub judice." Only a few years ago Wilson made the statement that apparently identical organisms may be recovered from healthy children as well as from patients with rheumatism and related infections. It is also true that blood culture from typical clinical cases of rheumatism frequently may remain sterile. So we can hardly look to bacteriology to solve our problem.

As Swift has well pointed out, rheumatism, like tuberculosis, does not come on as a typical acute infection but often has a long latent period. Gerstley's remark then that chorea does not act like an acute infection would certainly not disprove its rheumatic origin.

As can readily be demonstrated, pathology, too, cannot solve the question. The Aschoff body, it is true, is pathognomonic of rheumatism as is the tubercle in tuberculosis or the gumma in syphilis. This peri-arteriolar inflammatory nodule has indeed been demonstrated by Poynton and Holmes and others, in the brains of patients dying with chorea, along with areas of encephalitis or with meningitis. The verruca on the valve is also indisputable as to origin. But over the cases that come to autopsy there is no dispute. If the patient with chorea dies he dies of rheumatism or its complications. The question still remains whether he can have chorea without rheumatism.

Now, we wish to put together a number of observations. Hassler and Moller show that heart disease not preceded by arthritis is more fatal than when so accompanied. It is likewise true that the gravest complications on the part of the heart occur in rheumatism that is not linked up with chorea. Likewise, the subcutaneous nodule, of bad omen, is much more common when chorea is out of the picture.

This can only mean that a higher degree of immunity or shall we say of allergy, using the word to define a reaction that restricts the virus to a narrow field, exists in some cases than in others.

It makes one wonder whether the allergic phenomenon in the brain itself is not the true cause of the chorea. Edema of the tissues is a marked feature in rheumatism. This edema is fairly well controlled by the salicylates and hence their clinical value, despite their lack of influence on the underlying pathology. If there was any evidence that one part of the brain more than another was affected in chorea, it would not be far fetched to conceive of a local tissue response here, similar to the reaction we picture in the joints or heart wall.

Heubner states that the peculiar character of the choreic movement cannot be referred to the motor centers or tracts (anterior central convolution and pyramidal tracts). The intended movement in chorea is exaggerated. Flexion, extension, rotation, supination are all irregular in time, character and degree. Cobb has shown in electro-myographic studies that one characteristic thing is the inability to sustain effort. Both voluntary and involuntary contractions are weakened. This may be confined to one side—the so-called hemi-chorea. Now it has been demonstrated that a lesion of the corpus luyii (subthalamic body) may produce a hemi-chorea and, as stated dogmatically by Martin and Alcock, "there is very little evidence that focal damage to any structure in the brain other than the corpus luyii or its emergent fibres results in hemi-chorea." This, of course, is organic, persistent chorea. We might mention in passing that the body of Luys lies in the mid-brain just below the optic thalamus and just internal to the fibres of the pyramidal tract as they pass down from the internal capsule to the cerebral peduncle. To the medial side is the nucleus ruber. Below is the substantia nigra. The corpus receives its main body of fibres from the lenticular nucleus of the corpus striatum.

That the lenticular nucleus and the corpus of Luys may be of prime interest in connection with choreic symptoms is evident from the beautiful work of S. A. K. Wilson on the anatomy and physiology of the corpus striatum and on the rare disease known as chronic lenticular degeneration.

These papers are much too elaborate to quote extensively. Suffice it to say here that he demonstrates that the nucleus lentiformis is practically independent of the cortex. It connects with the subthalamic body and nucleus ruber to form

the so-called lenticulo-rubro-spinal tract. The function of this tract is to exert a steadying influence on the final common path (lower motor neuron) and to maintain the tone of skeletal muscle. In other words it has an inhibiting effect upon the cortico spinal or pyramidal tract and when this regulating function is in abeyance then appear involuntary movements, incoördinated movements and such symptoms as tremor and athetosis. The intended movement is exaggerated and incoördinate in time and degree, due to spasm and the attempt to anticipate spasm. And this is chorea.

In the disease known as chronic lenticular degeneration we have a toxic or infective factor acting selectively upon a basal nucleus. It is associated with marked liver pathology and certainly suggests the similar selective action that takes place in icterus gravis—the so-called "kern-icterus." In the disease first mentioned, classically described by Wilson, we have a selective action limited to the lenticular nucleus and corpus of Luys, and a wide train of symptoms embracing tremor, spasticity, dysarthria, dysphagia, paresis, et cetera.

It would seem to be reasonable to assume that the rheumatic virus also might exercise a selective action upon these nuclei and thus bring about this train of nervous symptoms that we have come to recognize as chorea. And if it be remembered that chorea occurs in those individuals presenting a high degree of resistance or allergic response, we might expect that localized edema would play a large part in the actual pathology. This might explain the rather dramatic response to certain lines of therapy, such as the injection of autogenous serum into the spinal canal or the induction of hyperpyrexia by diathermy or other means, or to such drugs as seem to have the power to induce a "reaction" accompanied by eosinophilia (sodium iodide, arsenic, nirvanol, foreign protein, et cetera).

This, of course, is mostly speculative and does not appear to include those cases unassociated with discernible infection—the cases of "pure chorea." It is possible of course that this is a misnomer and that the infection is there, although not clinically discoverable. It is really beside the point to refer to the sedimentation test as a distinguishing aid, because, admittedly, chorea only occurs in cases of low virulence. Possibly the test, after provocative therapy,

might prove of value. Nevertheless, unless all clinical observation is to be discredited, chorea does occur on a non-infectious basis and we have to face the question as to how this can be. What sort of mechanism is at work here?

Now, first of all is it possible that chorea can be caused on a purely psychic basis? What is the meaning of the seeming importance of the family's social set-up in Gerstley's experience?

Malamud calls attention to the fact that both the extra-pyramidal tract and the autonomic nervous system exert a marked influence on motor function. Also is it true that the vegetative nervous system is closely associated with the psyche? We have to reckon with the shadowy subject of conditioned reflexes and with the fact that abnormal motions may replace inhibited instinctive expression.

It is certainly possible to comprehend the possibility that under the influence of tremendous fright or excitement, with rapid breakdown of glycogen in the hepatic cells and production of excess of epinephrine, there might be augmentation of all nervous reactions and old pathways of conditioned reflexes and imitation arcs might be reopened. But could the expression in chorea-like movement be so close to chorea on an infectious basis as to defy differentiation? One is brought face to face with the fact here that Beattie and his confreres have been able to show that stimulation of certain hypothalamic centers can cause a widespread flow of impulses over the sympathetic system. The inference is plain, therefore, that these centers can and do act as a central depot for sympathetic reception. Thus a patho-physiological disturbance conceivably could be induced, by a different mechanism, in those very centers that would be concerned in a purely infectious process. In this connection we should mention that Obelli and others have shown that there is sympathetic innervation in skeletal muscle and a purely peripheral irritation might explain the mild twitchings often designated as "pre-choreic."

But what is back of this? Practically speaking, chorea may be said to be a pre-puberty disease. In other words the glandular activity and increased endocrine output of puberty changes the background in some way so that the choreic phenomenon ceases. The true explanation of this fact would go a long way to clarify our problem. One can hardly proceed further than

MEDICAL BOOKS FOR THE LAITY—KEYS

to restate the close connection between the endocrines and the normal functioning of the autonomic nervous system.

But perhaps we can proceed a step further. Widenbauer has brought forth some convincing evidence that the missing link in this whole discussion is the Vitamin B complex. On the basis of some very interesting case histories closely studied clinically and in the laboratory, he concludes that the "chorea constitution" (Gerstley also speaks of a typical chorea type) depends upon a long deprivation of Vitamin B. The neuropathic child and the young gravid woman are in similar stages of deprivation. The B complex is preeminently concerned in muscle, nerve and joint nutrition. Rheumatism and the various affections associated with chorea flourish when the supply is low. The very incidence of chorea, with a new year maximum and summer-fall minimum suggests the relationship. The complications of furunculosis and other staphylococcic skin lesions provide further evidence. He also points out the calcium deficit in

chorea and the relationship of tetany and parathyroid deficiency with B avitaminosis.

Recalling that prominent symptoms of beri-beri are circulatory—to wit, enlargement of the heart, arrhythmia, exaggerated action, systolic murmur—this would seem to furnish an interesting parallel to those "mobile" heart symptoms that Trousseau called the distinguishing mark of rheumatism. That there is also a close parallelism of action between vitamin and hormone has often been suggested.

Nevertheless, this is not to get away from the whole question of infection. Beri-beri itself is more than an avitaminosis. The element of microbial action is by no means excluded. Matsumara and his colleagues claim that the principal etiologic element is a Gram-negative motile bacillus. However this may be, it does not seem possible in the present state of knowledge to make the dogmatic statement that chorea is dependent on an infectious process, or, on the other hand, that it is not related to infection.

The writer is not defending either view. His purpose is to arrange and digest the evidence.

MEDICAL BOOKS FOR THE LAITY

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MANY people are reading and will read on medical subjects. The important immediate concern is that this material be authentic, well written, and on a subject of medical importance. Certainly the publishing field bears witness to the popular demand for medical knowledge. A glance at the Index Catalogue of the Library of the Surgeon-General's office (the largest medical library in the world) shows that members of the staff of the library have cataloged at least 1,500 manuals of popular medicine, 400 more extensive books on the subject and more than 140 popular medical journals. Most of the journals are extinct. Even syphilis, which until recently was whispered about over the radio as "the social disease," has been given wide publicity to help in its prevention and ultimate cure. Recent authoritative treatises published in 1937 on this subject have included: S. W. Becker's "Ten Million Americans Have It" (Lippincott), Morris Fish-

bein's "Syphilis, The Next Great Plague to Go" (McKay) and Thomas Parran's "Shadow on the land, Syphilis" (Reynal and Hitchcock).

An important medium for information on popular medicine and hygiene are the health journals. Such is *Hygeia*, the authority and reputation of which is above reproach.

The American Medical Association and the National Health Council also publish pamphlets on many subjects in the field of health and preventive medicine. The Department of Health and the Department of Labor of the United States contribute similarly to popular education on problems connected with good health. These pamphlets are published at cost and are available to all persons.

In establishing a basis for the selection of popular medical books the following criteria were used: (1) that they be written in words understandable to the average layman with a simple vocabulary and in well written, pleasing style; (2) that they be written on good authority on

*Reference librarian, The Mayo Clinic, Rochester, Minnesota.
MAY, 1938

a subject of importance; (3) that they be published by a reputable house, and (4) that they do not attempt "cure-alls" or try to take the physician's place. The cure of disease we trust to our physicians and the progress of medical science bears witness that the ills of mankind are placed in safe hands.

For the rural communities there have always existed a few "family physicians" and home doctor books. One of the uses of these books, in days of poor transportation, was to suggest what to do before the doctor arrived. Today, they are worth while in cases of emergency. A recent book published on good authority is Dr. Morris Fishbein's "Modern Home Medical Advisor" (Doubleday, 1935). A book of the same type published primarily for social workers is Dr. R. C. Cabot's "Layman's Handbook of Medicine" (Houghton, 1937).

An interesting approach to the lay study of medicine lies in what may be termed "get acquainted books." These include books on medical history and biography. One of the most inspiring books I have read is Gustav Eckstein's "Noguchi" (Harper, 1931). It not only introduces the reader to a remarkable personality but is a story of the fight against infectious diseases told in such a way that it is profitable to the laity.

Hans Zinsser has written in a vivid manner the story of typhus fever in his "Rats, Lice, and History" (McClelland, 1935).

One cannot go very far in getting acquainted with medicine before coming into contact with the works of Sir William Osler. His essays, "Aequanimitas, with Other Addresses to Medical Students, Nurses and Practitioners of Medicine" (Blakistons, 1920, ed. 2) inspire in the reader great respect for the medical sciences. This is a type of book that will appeal especially to a first year medical student. Similarly, the excerpts from his writings in "Counsels and Ideals" (Houghton, 1921, ed. 2) make good reading. Perhaps the best written history of medicine from the standpoint of the laity is Osler's "The Evolution of Modern Medicine" (Yale, 1921). To become acquainted with the man one should read his life, "The Great Physician" (Oxford, 1934) by Edith Giltings Reid. A more scholarly biography is H. W. Cushing's "The Life of Sir William Osler" (Clarendon Press, 1925, 2 v.).

Other important medical biographies or autobiographies include Vallery-Radot's "Life of

Pasteur" (star edition), R. M. Wilson's "The Beloved Physician, Sir James MacKenzie" (Macmillan, 1926), Nathan C. Goodman's "Benjamin Rush" (University of Pennsylvania Press, 1934), Victor Heiser's "An American Doctor's Odyssey" (Norton, 1936).

In the field of medical history mention might also be made of Victor Robinson's "History of Medicine" (Froben reprint), H. W. Haggard's "The Lame, the Halt and the Blind" (Blue Ribbon, reprint, 1935) and Morris Fishbein's "Frontiers of Medicine" (Williams and Wilkins, 1933).

There is need for an authoritative popular book on human anatomy. Barnes and Noble have published an "Atlas of Human Anatomy" (1935) with colored illustrations by Franz Frohse and Max Brödel. This is good, but a more extensive book is needed.

In the field of physiology, the functional study of the human body, an excellent book is Dr. Logan Clendening's "The Human Body" (Knopf, ed. 3, 1937). Dr. Clendening included in his book, also, the body as it is related to disease and the development of medical science in the combat of disease. A recent book which promises to be of interest is A. J. Carlson's and Victor Johnson's "Machinery of the Body" (University of Chicago, 1937).

A large percentage of the patients who are being seen by physicians today are suffering from functional neuroses and chronic nervous exhaustion in general. Some of these patients, no doubt, have received from books not written for the laity information from which they have drawn faulty conclusions and they may have imagined their many ills. For the nervous patient himself, however, Dr. W. C. Alvarez has written his monograph, "Nervous Indigestion" (Hoeber, 1931). It makes enjoyable and profitable reading. Two books that deal with normal psychology are H. A. Overstreet's "About Ourselves" (Norton, 1927) and G. H. Dorsey's "Why We Behave Like Human Beings" (Blue Ribbon, reprint, 1930). Justification for neurotic personalities is expressed in L. E. Bisch's "Be Glad You're Neurotic" (McGraw-Hill, 1936). The history of insanity in America is well written in Albert Deutsch's "The Mentally Ill in America" (Doubleday-Doran, 1937). Books that share personal experiences in hospitals for the insane with the reader are the following: C. W. Beers' "A Mind that Found Itself" (Double-

day-Doran, reprint, 1932), M. M. Woodson's "Behind the Door of Delusion" (Macmillan, 1932) and W. B. Seabrook's "Asylum" (Harcourt, 1937). "Why Men Fail" (Century, 1928, edited by Morris Fishbein and W. A. White) is an analysis of the causes of failure, written for the average man or woman by the leading psychiatrists in the country. It also tells how failure may be turned into success.

An important bibliography on health books for the laity is that of Dr. Fishbein. This is published under the auspices of the American Library Association. A more up-to-date list may later be published by the Medical Library Association and also by the National Health Council. It is in this field that the intelligent layman must be directed if a national health program is to be realized.

It is through the efforts of both the laity and the medical profession that measures for preventive medicine and hygiene will be further adopted on a large scale. Authoritative books written for mature minds on this subject include the volume by W. E. Burkard and others: "Health and Human Welfare" (Ryerson Press, 1937), C. F. and N. W. Bolduan's "Public Health and Hygiene" (ed. 2, Saunders, 1936), and C. E. Turner's "Personal and Community Health" (ed. 4, Mosby, 1935).

While public hygiene deals with mass phenomena it is quite inseparable from personal hygiene. And it is important that the individual be schooled in how he can preserve his health and thus play his part in preventive medicine. C. W. Crampton's "The Boy's Book of Strength" (McGraw-Hill, 1936) is written especially for the adolescent interested in athletics and is an outstanding book. Logan Clendening's "Health Chats" (McKay, 1936); W. W. Bauer's "Health Questions Answered" (Bobbs, 1937); C. E. Turner's "Personal Hygiene" (Mosby, 1937); and L. E. Hawkin's "Health in Youth and Age" (Hillman-Curl, 1937) are among the newer

books on this subject. M. J. Exner's "The Sexual Side of Marriage" (Norton, 1932) is a plain, frank, and practical book, and not poetically allusive like so many that have been written. The American Red Cross textbook on "First Aid" (revised edition, Blakiston's, 1937) is an excellent manual. It should be available in all homes in case of accident.

Books on diet should, I think, be recommended only on the advice of the physician. This should hold true for handbooks for patients suffering from such diseases as diabetes. In such diseases particularly, recovery depends on the intelligent coöperation of the patient. For patients suffering from arthritis, H. N. Margolis has written "Conquering Arthritis" (Macmillan, 1932).

To show up the quack and to help the laity to be on their guard against nostrums the American Medical Association has published "Nostrums and Quackery" (in three volumes, 1912-1936, volumes two and three edited by Arthur Cramp). Morris Fishbein has written "The Medical Follies" (Boni and Liveright, 1925) and "Fads and Quackery in Healing" (Blue Ribbon, 1935). An exposé of the drug racket is found in A. Rallet and F. J. Schlink's "One Hundred Million Guinea Pigs" (Vanguard Press, 1933). Of special interest to women is Mary Catherine Phillips' "Skin Deep; the Truth about Beauty Aids—Safe and Harmful" (Vanguard Press, 1934).

In conclusion, I might add that many books have not been included in this résumé. Some books have not met the requirements set up in the rules of selection, and of some books I have not had knowledge. If, however, I have suggested a few good books which may encourage others to read on a subject of vital importance and if I have shared with some of you my experiences in this field I shall have accomplished my aim.

LIVER EXTRACT IN GENERAL THERAPY

Case Report

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FROM the time of my first impression of the efficacy of liver therapy in pernicious anemia, I have felt that it should be given a trial in other forms of debilitating diseases which were slow in recovery. Hence, during the several years in which liver has been on the market, I have used liver and liver extract in such cases. In using it on post-influenza cases routinely, I have felt that the therapy has shortened the period of exhaustion and general debility with which the patient has invariably contended for weeks and even months. Clinically, the same has held true for patients convalescing from pneumonia and empyema. I have also resorted to the use of liver extract in the treatment of those late winter and early spring patients from whom nothing tangible could be obtained except the histories of depletion and exhaustion so frequently attendant on long confining winters aggravated by minor ailments. It needed but trial to prove that liver extract had a decided restorative effect upon these patients far superior to that of other tonics and drugs.

It is an interesting thing to find that occasionally a case of essential hypertension will respond to liver. Again, others show no appreciable change. Since combining Rhodan with liver therapy in these cases, I have had more encouraging results than with any other form of treatment.

In piloting expectant mothers through to term with the usual pre-natal care I have found upon several occasions albumin in the urine and an increase in blood pressure towards the end of their pregnancies. After receiving 2 c.c. of liver extract two to three times a week for a couple of weeks, such patients have improved, their blood pressure has been lowered and the urine became albumin-free. I have considered these cases toxic types.

Recently I employed liver extract in the treatment of a patient with acute nephritis. Although to my knowledge it has not been recommended in the treatment of this disease, I am reporting the following cases with the suggestion that its use might merit further trial.

Case 1.—Mrs. J. H., aged thirty-nine, married and the mother of one child, consulted me February 23, 1936. She complained of headache, loss of appetite, swelling of the face, hands and legs. She had observed she was passing a decidedly small amount of urine during the day, and she stated that she had been getting progressively worse since she first noticed the onset of the trouble some one week previously. The scanty specimen of urine passed for examination revealed albumin 4 plus, casts and blood cells and cellular debris. The blood pressure was 178/118. There was marked edema of the entire body, especially of the extremities. I advised hospitalization, and upon refusal instructed that she be given complete bed rest and kept warm. Food was restricted to three glasses of skimmed milk or the same amount of home-made buttermilk per day—a Karell diet. Epsom salts were to be taken as needed. Before she left the office I gave her 2 c.c. of liver extract intramuscularly, and advised her to return in five days. On February 29, when she reported to the office

I gave her the second injection of 2 c.c. of liver extract. The urine showed no improvement, but she stated that she had been passing more urine, that the headache was leaving her, and that she felt better generally. On March 7, she received her third 2 c.c. of liver extract. The urine showed a definite decrease of albumin. The edema was practically gone. She stated she was feeling greatly improved, and the headache had left her. On March 15, the fourth 2 c.c. of liver extract was given. The albumin was one plus and the edema was gone. She stated she felt so well at this time that she hoped she would not have to report at the office for further treatment. On March 24 she was given her fifth and final injection of 2 c.c. of liver extract. The urine was negative for albumin. She stated she felt "just fine," and she looked well.

I did not see this patient again until April 15, 1936. The urine then was normal. The blood pressure was normal. She looked as well as at any time in the period that I had known her, and she stated that she had not felt so well for several years. I have seen her occasionally since that time, and she has remained well. On March 6, 1937, I examined the urine again and it was normal. The last time, January 26, 1938, the urine again was normal.

Case 2.—The use of liver extract in a case of orthostatic albuminuria was followed by the disappearance of the albumin. A boy of seventeen was seen in July, 1936. The diagnosis of orthostatic albuminuria had been made two years previously and he had been told that the condition was of no significance and that he would outgrow it as time went by. He had learned to test his urine and was able to demonstrate albumin most of the time. It appeared to be more abundant when he was tired or following strenuous exertion. The boy had become introspective and apprehensive about his condition.

The boy was a well built young man with splendid physique, and the picture of health. The urine contained albumin plus two, on a basis of four. He was given empirically 2 c.c. of liver extract intramuscularly at five-day intervals for five doses. Following the first liver extract injection, the albumin disappeared from the urine and has not recurred.

Case 3.—In another case of a boy of fourteen the injection of liver extract seemed to be of benefit. The boy's father told me that the boy had not complained of anything in particular but that he had observed throughout the summer a lack of energy and a marked diminution in his ability for sustained work. His appetite was poor, his skin pasty and pale, and he had gained no weight during the summer.

Physical examination was essentially negative, except that the boy did not look well. His tonsils were greatly enlarged but only moderately inflamed. The urine showed a strong plus albumin. Following two injections of 2 c.c. of liver extract at five-day intervals the albumin disappeared, and following tonsillectomy the urine remained albumin-free.

After having experimented with liver and liver extract in general disease, I have come to the conclusion that the clinical results have been so intriguing that I was finally prompted to make this report. It would, indeed, be interesting to follow this work under a purely scientific setting so that a more complete report could be made. I firmly believe that the full measure of the possibilities of liver extract in the treatment of disease other than pernicious anemia has not yet been taken.

HISTORY OF MEDICINE IN MINNESOTA

SURVEY OF PIONEER MEMBERS OF THE ST. LOUIS COUNTY MEDICAL SOCIETY

By RICHARD BARDON, M.D.

(Continued from April issue)

The Establishment of St. Luke's Hospital

The following article, written in 1921, was taken from the records of the hospital:

"In an old shack located on Third Ave. East, between Superior St. and the alley, St. Luke's Hospital opened for business. First steps for the organization of a hospital for Duluth were taken on October 18, 1882. One month later, the doors of the makeshift institution opened and members of the first board were hustling about to collect the \$25, a month due for the structure. The town people being at that time more full of enthusiasm than cash, the first month's rent devolved upon the chairman of the board, Col. Charles H. Graves, and at the end of the first month's financial statement this contribution and a lone five dollar bill were all that glorified the treasury. For furnishings, the British Consul loaned the use of a range from the Government building, two beds had been begged from worthy citizens, as had one table, a few chairs and a blank book in which to register the rush of incoming patients. Mrs. Jessie Guion, an efficient matron, was engaged at \$50 a month.

"At four o'clock on the afternoon of Nov. 18, a man on the Northern Pacific railroad broke his leg and by five o'clock the establishment of the hospital had been justified and has been ever since. This patient kept the hospital 'staff' busy for two months but added not a cent to the treasury until he was able to get back to work. A typhoid fever case caused temporary relief and excitement by paying \$14 in advance only to have it efficiently counterbalanced by his remaining and requiring ten weeks care. One of the younger physicians, who had a very sick patient not long after, had him removed to the hospital, figuring that the man's death being only a matter of hours, an autopsy could be more conveniently performed with new equipment at hand. His plans went awry the following morning when he found his patient had recovered over night.

"It was a time of discouragement and stress to all concerned—a time when the water supply depended upon the strongest muscle and the largest pail; when the primitive means of sewage disposal and menace of typhoid necessitated most careful watching. Only the miraculous grit and determination of the board members carried this child of their brain to a sturdy maturity, though it was not long before 3,500 inhabitants of Duluth awoke to the needs the hospital was meeting and more and more opened their hearts and purses. Within two years the next step to a permanent building had been instituted and St. Luke's began climbing upward, this time to Second Avenue East and Fourth Street, where property had been purchased and a substantial building erected with a small indebtedness, some \$1,700 being all that was assumed at that time.

"Rev. C. A. Cummings, the rector of St. Paul's Episcopal Church, was then the leading spirit in the organization of St. Luke's Hospital. He was aided by a board consisting of Col. Graves, G. V. I. Brown, Thomas B. Cullyford and Mrs. Ella B. Stone. The physicians of the town included Drs. Ritchie, Graff, Walbank, E. E. Collins, S. C. McCormick, C. F. McComb, George Davis and F. C. Sherwin.

"Upon the removal of the hospital to the new quarters on Second Avenue East, Mrs. Guion remained but a short time, to be followed by Miss Mary Scott as superintendent. The years following witnessed typhoid epidemics enough to try the staunchest heart and the new hospital was taxed far beyond its capacity and beyond the facilities it possessed to care for these patients.

"St. Luke's was also filling the rôle of a welfare institution, for at that time the Y.W.s and Y.M.s were not organized as they are now. The hospital seemed to be the center about which all charity and welfare work revolved and it was aided in many of these directions by the big-hearted men and women of the growing town who spent time, strength and energy to keep alive the sparks of helpfulness and assistance for those who blindly turned to this institution for help of all sorts. One father, mother and two children drove in forty miles to ask aid in locating an adventurous son who had set out unannounced to see the world. The hospital housed the parents and children for a week, while the means at hand were set in motion to find the young Columbus. Thanksgiving Day, 1884, according to the *Duluth Herald* of that date, found nineteen patients in the hospital enjoying a bounteous turkey dinner furnished by Thomas Cullyford, at that time proprietor of the St. Louis hotel. The account also notes but 'one female' amongst the patients, which at least was worthy of special mention.

"This hospital had one ward with fifteen beds, one private room, a sitting room on the second floor for the use of all patients and a small dispensary, used also for surgical emergencies. It was not many years before the limitations of the building were apparent and the present property at the corner of Ninth Avenue East and First Street was purchased. In 1900, the foundation was laid and on October 1, 1902, the present St. Luke's was opened, with a nominal capacity of seventy beds. The building cost in the neighborhood of \$100,000, and at that time was considered one of the best equipped in this part of the country."

A later addition, greatly enlarging the hospital capacity, was opened in 1925.

St. Mary's Hospital

The following data concerning the organization of St. Mary's Hospital appeared in 1933, on the occasion of the forty-fifth anniversary of its foundation:

"In February, 1888, when Duluth was a pioneer city of a few thousand inhabitants, a small band of Sisters of St. Benedict—members of a religious community founded by St. Benedict for the purpose of caring for the sick and infirm—opened the City's second hospital in a small building at Twentieth avenue west and Third street." (Now St. Ann's Home.)

"Of that band, the last survivor, Sister Helen, died five years ago, but through the years younger members of the order took up the work and carried on under the direction of Mother Scholastica, the first president of the old St. Mary's Hospital Association.

"The first staff was composed of Mother Alexia Kerst and six other Sisters. The late Dr. W. H. Magie, one of the first members of the hospital staff, performed the first appendicitis operation at the hospital in 1891, and the first gastro-enterostomy operation in 1895.

"In those days, records still kept by the hospital disclose, patients came from miles around by carriage and sleigh. They were transported from floor to floor in a hand-operated pulley elevator, and their rooms and the wards were lighted by gas.

"In 1896, eight years after the first hospital was opened, the need for a larger building to accommodate the increasing number of patients resulted in the Benedictine Sisters purchasing the present hospital site at Fifth avenue east and Third street and constructing the first unit of the present hospital. In 1911, continued growth necessitated an additional wing having an increased bed capacity of sixty patients. In 1920, a new unit of six stories and a capacity almost equal to the then existing hospital building was added at a cost of \$450,000.

"Other improvements included the out-patient department which was added in 1922; remodeling in 1924 to provide additional operating rooms, laboratory, supply room, an occupational therapy department, physical therapy department, a pediatrics department, x-ray offices, roentgenologist, orthopedic cast room and supply rooms.

"The hospital at present has a 290-bed capacity, forty Sisters on the administration and nursing staff, 104 student nurses, thirteen lay graduate nurses, three anesthetists, two physical therapists, an occupational therapist, a dietitian, eight laboratory technicians, and seven record room and office workers, eighty-eight

HISTORY OF MEDICINE IN MINNESOTA

physicians on the regular staff, seventy-three on the visiting staff and eight resident internes."

In the introduction to the medical history of St. Louis County, mention is made of the hospital ticket system. The Sisters of St. Benedict began to issue hospital tickets in the fall of 1898, and discontinued their sale on July 1, 1913, when the Working Men's Compensation Act was passed by the State Legislature. The tickets were sold to laboring men and lumberjacks, a ward ticket costing \$9 and a double room ticket \$12. Physicians and surgeons received as compensation \$2 per week for each patient under their care while hospitalized. The hospital ticket system was not only of great benefit to the lumberjacks and laboring men in general, but also helped to build up the hospital.

PIONEER PHYSICIANS OF THE VERMILION AND MISSABE RANGES OF MINNESOTA

By OWEN W. PARKER, M.D.

IN a recent history of Minnesota, it is stated that Minnesota has furnished much of the testimony from which scholars have traced the history of the earth's crust. Here and there are rocks laid down in the early periods of geologic time, which tell of the conditions which existed here long before there were eyes to see or hands to record them.

Thus the records of the Vermilion and Missabe Ranges, which came to the white man's attention only about eighty years ago, have yielded scraps of information which, pieced together with other scraps, give us much of the story of the earth during its remote past. For instance, inasmuch as only the lowest forms of algae have left their fossil imprints in these ores, geologists have concluded that the great iron ore depository era must have been contemporaneous with the beginning of life on the earth. Also, other evidence left in the rocks proves that since these huge bodies of iron rust were laid down, Minnesota's area has been elevated and depressed repeatedly. This northern area of Minnesota is said to be the backbone of the continent. It had thrust its nose above the waters long before the Appalachian System or the Rocky Mountains were formed. These systems are only infants in geologic age compared to our own section.

In this great drama, it is interesting and inspiring to contemplate that it fell to the lot of our present pioneers to discover this great body of iron ore, after it had been deposited in the earth's crust untold ages before, and to turn it to the use of mankind.

In this work of the pioneers, we find that the pioneer doctors did their part equally well.

The discovery of iron ore on the Vermilion Range in the neighborhood of Tower brought settlers and a rush of miners to this vicinity in 1883 and 1884. The first load of iron ore from the State of Minnesota was shipped to Two Harbors from Tower in 1884, and was hauled by the Duluth and Iron Range Railroad. Mr. Thomas Owens was the engineer. He afterwards became superintendent of the road and is still living at Two Harbors, and is widely known in this section.

On July 31, 1934, the fiftieth anniversary of this event was celebrated by the Old Settlers and Pioneers of the Vermilion and Missabe Ranges. A monument commemorating this momentous occasion was unveiled at Soudan, where it stands near State Highway No. 1.

It had been known for a number of years that there was iron ore in this vicinity, but no active operations had ever begun before. George Stuntz, who settled on Minnesota Point in 1852, was one of the active explorers. He interested George Stone, who in turn interested Charlemagne Tower of Philadelphia. Charlemagne Tower organized the Minnesota Iron Company and started developments in the vicinity of Tower at the Soudan Location. Tower, of course, was named after him and became the mother city of all the Range towns. The mining location of Soudan was kept separate from the business location which was at Tower from the very beginning and has ever remained separate so that at no time has there been any business of any kind in the way of stores in Soudan.

This community had experienced a gold rush following the Civil War, gold having been discovered on Gold Island, in Lake Vermilion, and other places, and as a result of these various rushes and trips the Vermilion Trail had been established through the efforts of George Stuntz. A monument to the memory of this great pioneer stands at the entrance of Hibbing, in Stuntz township.

With the rush of early settlers to Tower for the mining of iron ore, there came Dr. Isaac van Dusen. As far as can be ascertained, he was the first doctor. He remained there for about one year. It is stated that he was a homeopath.

In 1885, it is said, Dr. John Alden came to Tower and remained there about five years, until 1890. He was in private practice. During 1887 there were exploration camps at Ely, and Dr. Alden used to visit these camps at Ely, often riding on horseback to them, a distance of twenty to twenty-five miles.

I am told by old timers that for a few months in the summer of 1887 Dr. Alden had an assistant, a Dr. Anderson, stationed at Ely. He was a young man about twenty-five years of age. A little later Dr. Joseph B. Noble came to Tower and remained there for a number of years.

The first doctors for the mining company at the Soudan Mine, so far as can be learned, were Drs. Robert and William Hutchinson, who came originally from Capron, Illinois. One of them has a son living there at the present time who is a doctor. These men were the first doctors to take care of any iron mining company medical practice in Minnesota.

The Minnesota Iron Company erected the Soudan Hospital in the spring and summer of 1889. This hospital was the first on any of the iron ranges in Minnesota. It stands on its original site and is still owned by the mining company, having passed on to the Oliver Iron Mining Company when the U. S. Steel Corporation was organized in 1901.

The first doctor to come to this new hospital for the mining company was Dr. W. E. Harwood, of Joliet, Illinois, who took charge on May 1, 1889, and remained there until October 1, 1897. His health failed and he was forced to stop practice for a time and left for the west, living for a time at Denver, Colorado. After his health improved, he returned to the Range, locating at Eveleth to take care of the Minnesota Iron Mining Company's work at the Fayal Mine. In 1900, he established the Fabiola Hospital, and had associated with him Dr. Fred Barrett and Dr. Charles Lenont. Dr. Harwood later, after a number of years at Eveleth, gave up the work to specialize in his practice, and located in his former home in Joliet, Illinois, remaining there until the outbreak of the World War, when he joined the English Medical Service. He contracted pneumonia and died while in service at one of the surgical stations at the front in 1915 or 1916.

Dr. Harwood's first mining practice experience was at Ishpeming, Michigan, where he was an assistant to Dr. Bigelow, along with Dr. Shipman. He was a man of studious habits, fine character, and very conscientious in his work, always trying to improve himself, even through his last years. When he finally left the

Range, a testimonial dinner was given him, attended by a large number of his friends.

Associated early with Dr. Harwood at the Soudan Hospital was Dr. Wm. W. Richardson, a graduate of the Northwestern Medical College, who interned in Cook County Hospital. He came originally from Princeton, Illinois. This town happened to be the home at one time of a brother of William Cullen Bryant, the poet.

After Dr. Harwood left the Soudan Hospital on account of his health, Dr. Richardson became head of the hospital and continued so from October 1, 1897, to October 1, 1901.

After leaving Soudan, Dr. Richardson went to Alabama as surgeon for the Tennessee Coal and Iron Company, remaining until about 1905, when he located at Los Angeles, California, becoming a prominent surgeon and specializing there in bone and joint surgery. While operating in May, 1924, he was suddenly seized with a heart pain which compelled him to stop the operation and immediately go to bed. He lived only a few days. At autopsy, his death was found to be due to coronary thrombosis. He was a very capable man in medicine, well trained, and an excellent surgeon. He read German and took German medical publications even while at Soudan as a young physician. He held a teaching position in one of the medical schools at Los Angeles, and was in the World War, stationed somewhere in Europe. He was a great admirer of Christian Fenger, having worked with Fenger in Cook County Hospital. It was the privilege of the writer to be associated with him during his first few months on the Range. Dr. Wm. de La Barre of Minneapolis was also associated for a number of years with Dr. Harwood and Dr. Richardson of Soudan.

Dr. Charles Goodrich Shipman was the first physician to locate in Ely, Minnesota. As previously stated, there had been exploration camps in Ely during 1887 and Dr. Alden of Tower at times made visits to these Ely camps, but there had been no permanent physician until Dr. Shipman came.

Charles Shipman was born August 27, 1856, at Madison, Wisconsin. His father was a veteran of the Civil War and was commonly spoken of as Colonel Shipman. Dr. Shipman attended the Wisconsin University at Madison three years. His family moved to Chicago in 1874, and there he attended the old Chicago University for one year. He graduated from Rush Medical College in 1881 and was president of his class. He took special work in surgery under Dr. Moses Gunn, and during his final year was Dr. Gunn's clinical assistant. He practiced medicine in Chicago for one and a half years when in 1882 he received an appointment as assistant to Dr. Bigelow, chief surgeon of the mining companies at Ishpeming, Michigan. He remained four years at Ishpeming, when in 1886 he was appointed chief surgeon for the mining company at Bessemer, Michigan, on the Gogebic Range. He built a hospital and remained there about two years, but, his health failing, he sold the hospital and spent some months recuperating in California. Later he was appointed Chief Surgeon for the mining company at Ely, Minnesota. He left for that district in May, 1888, and walked into Ely the last five miles, carrying such medical equipment and instruments as possible. Among these were dentist's forceps, as the mining physicians in those days before dentists arrived had to do extractions. For many years in the attic of the Shipman Hospital at Ely there were some old amputation knives about a foot or more long that Dr. Shipman had carried with him on this occasion, and there still remain some of his old dental forceps.

The railroad was built into Ely from Tower and the first passenger train was run on July 4, 1888, but when Dr. Shipman came in May, 1888, a portion of the

track had sunk in a muskeg swamp about three miles out of Ely so that the track was impassable for trains.

Mrs. Shipman came on later in July, 1888. It took thirteen hours to make the trip from Duluth to Ely, Mrs. Shipman said, and the day coach left the track three times within the distance of 117 miles.

Dr. and Mrs. Shipman first had two rooms in Ely over a hardware store which was doing undertaking and there was a big sign, "Undertaking," in letters eighteen inches high. This was the source of many jokes at Dr. Shipman's expense. Before winter, Dr. Shipman had finished the building which was the first drug store in Ely, and which is still continued as a drug store. He lived in the store and had a front reception room and operating room and office.

During the spring of 1892 he started building the Shipman Hospital and finished it during 1893. When the panic of 1893 struck the whole country, it hit the iron ranges very hard, closing all mines. Someone said that during that year Dr. Shipman called the Shipman Hospital "Shipman's Monument"—it looked as though there would never be any use for it on the Range.

Dr. C. W. More of Eveleth, Minnesota, was Dr. Shipman's first assistant at Ely. Dr. More came to Minnesota in 1888, as assistant to Dr. S. C. Maxwell of Two Harbors, who had been appointed as physician to the employees of the Duluth and Iron Range Railroad Company at Two Harbors. About a year later, Dr. More accepted a position with Dr. Shipman at Ely and remained there over four years.

After Dr. More left Ely, Dr. H. E. Wunder came as assistant to Dr. Shipman, and remained until 1899. Later he was in charge of the Soudan Hospital, but left the Range about 1905, and now lives in Shakopee, Minnesota.

Of the many physicians associated at one time or another with Dr. Shipman, the pioneer physician, Dr. C. W. More, Dr. D. C. Rood, Dr. R. L. Burns,† Dr. George T. Ayres and the writer are still in this district—Duluth, Two Harbors and the Range.

Dr. Shipman left the Range in 1908 because of poor health. He went to Ocean Park, California, and for five years stopped the practice of medicine, then started in the practice of medicine again and practiced steadily five years until his death in 1918. He died suddenly in his own office, just after making a professional call on a patient.

Dr. Shipman was a man of magnetic personality, fine physique and handsome appearance. He was an excellent story teller and could tell innumerable stories in all the dialects, such as French, French-Canadian, Italian, Swedish, and especially the old Cornish miner dialects. He was an excellent entertainer and very hospitable, and was frequently visited by mining officials and other people of prominence who came through the Ely district. He was a sportsman and outdoor man, loved hunting, fishing, boating and baseball, having at one time been a player himself. He was also an excellent billiard player as well as an amateur boxer in his early life. He is still remembered by the old timers of the Range and is often spoken of in terms of affection and appreciation. He was an unusual character, and once one met him one never forgot him.

As a pioneer physician, he is entitled to great credit for the work he did in maintaining a high standard of medical practice on the Iron Range in the early days.

Dr. William H. Magie, one of the most prominent and able surgeons of Duluth and northern Minnesota, well remembered by all, built a small emergency hospital

†Since this was written, Dr. Burns has retired and gone to California to reside.

at Biwabik in 1892. Dr. Magie had been appointed surgeon of the Duluth, Missabe and Northern Railroad Company and for several of the mines operating in the Biwabik district.

The famous Merritt family of Duluth, Frank Hibbing and other explorers had done a great deal of work upon the Missabe Range, and it was commencing to open up at about this time. Dr. Magie placed in charge of the hospital Dr. Carroll Corson, who thus became the first physician to locate in Biwabik. In the same year, 1892, Dr. James R. Humphrey opened an office in Merritt, which was situated one mile east of Biwabik. He too was a surgeon for several of the mining companies operating in the district.

In 1893, the village of Merritt was almost destroyed by fire, and was never rebuilt. Dr. Humphrey moved his office to Biwabik where he built a small emergency hospital.

In 1894, Dr. Corson left Biwabik and Dr. Humphrey purchased the hospital owned by Dr. Magie. Dr. Humphrey operated the hospital and practiced in Biwabik until 1898, when he sold out to Dr. R. J. Sewall of Minneapolis. Dr. Sewall remained in Biwabik one year and removed to McKinley four miles west in 1899. Dr. Sewall sold the hospital in Biwabik to Dr. Charles W. Bray of Minneapolis, who moved to Biwabik in 1899. In 1906 the original building was destroyed by fire. A much larger hospital was built on the old site. This was operated by Dr. Bray, a greatly respected physician of Biwabik, until his death, July 8, 1937. Dr. Bray's wife, Mary B. Bray, is a graduate of the University of Minnesota Medical School, and assisted him very materially in the practice of medicine during their first few years in Biwabik. It is interesting to observe that of Dr. Bray's family of three sons and one daughter, all three sons are physicians, a truly medical family, and of the highest type.

Dr. H. L. Darms, with his wife, located at McKinley in 1892, very soon after the village had been organized. He served as mayor of the village in 1893. He left in 1894, going to Eveleth for Dr. More, who was sick. After this, McKinley was without a local physician until 1899, when Dr. R. J. Sewall moved there from Biwabik. In 1900 Dr. Sewall sold out to Dr. J. C. Farmer of White Bear, Minnesota, who practiced there until his death in 1921. Since that time, McKinley has had no resident physician.

The first doctor to settle in Virginia was Dr. James R. Humphrey, whom we have mentioned as having been early in Biwabik. This was in 1893. Dr. Humphrey was presumably in Virginia for only a short time, as he seems to have been in Biwabik until 1898. After him at Virginia came Dr. Stewart Bates, in 1893, and Dr. C. W. Miller. Dr. Bates built and operated the first hospital in Virginia.

Dr. Z. K. Brown came to Virginia in 1896 and died there from typhoid fever in 1899.

Dr. C. B. Eby was the first doctor to locate in Mountain Iron, about 1898. He was later associated with Dr. Avery and practiced in Virginia in 1901. He left the Range and later located in Spring Valley, Minnesota, where he lived until his death a few years ago. His death occurred while he was making a call to see a patient.

(To be continued in June issue)

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE

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Surgical Relief of Adhesive Pericarditis

ADHESIONS between visceral and parietal
layers of the pericardium may not be suffi-
cient to cause symptoms. This condition is not in-
frequently first discovered at necropsy. When
existing in conjunction with valvular heart dis-
ease, as is usually the case, thickened pericardium
may aggravate the picture of valvular heart dis-
ease. When the pericarditis has been accompa-
nied by extensive fibrosis of the parietal peri-
cardium and has involved the surrounding struc-
tures of the mediastinum, the clinical picture
may closely resemble cirrhosis of the liver, with
enlargement of the liver, ascites with or without

dependent edema. These three clinical types were
nicely described in an analysis of fifty-five proven
cases by George Douglass Head* of Minneapolis
in 1905.

Many a case of adhesive pericarditis has been
erroneously diagnosed cirrhosis of the liver and
its diagnosis is not easy. The history of a heart
pain in conjunction with an attack of rheumatic
fever is very important. A large heart not suffi-
ciently accounted for by the valvular lesions pres-
ent, an enlarged liver and ascites with little or
no dependent edema should arouse the suspicion
that adhesive pericarditis is causing cardiac hy-
pertrophy through adhesion to the chest wall,
diaphragm and mediastinal structures or per-
haps by scar tissue interference with venous re-
turn to the right auricle. A fixed heart, systolic
retraction at the apex and Broadbent's sign are
all of some value, but fluoroscopic examination
of the heart revealing a tugging of the diaphragm
or hilus shadows is more likely to be of diagnos-
tic value.

The idea of the possibility of surgical relief in
certain selected cases was first proposed at the
turn of the century. Delorme's suggestion of de-
cortication was first considered too radical.
Braucher's proposal, made in 1902, of removing
the ribs overlying the heart was more conser-
vative and more often employed, but proved in-
adequate in most cases as it relieved only the
tug on the anterior chest wall and did nothing to
relieve the constricting effect on the heart in
diastole or the interference with venous return
to the heart. Sauerbruch, in 1913, resected a por-
tion of fibrosed pericardium in one case with re-
lief of symptoms. Since that time numerous cases
have been reported in which thickened adherent
pericardium has been stripped off the heart
muscle and removed, the adhesions having been
separated even as far back as the vena cava.
The experimental and clinical work of Claude S.
Beck have been outstanding in this country and
he has reported numerous successful results.

The operation of cardiolysis following the sug-
gestions of Delorme is, needless to say, highly
technical. Avoidance of the pleural spaces, strip-

*Head, G. D.: Chronic adherent pericarditis. St. Paul Med.
Jour., 7:251-259, 1905.

ping off of thickened pericardium without injuring heart muscles and vessels, the use of negative pressure and the avoidance of postoperative "pneumocardiatic tamponade" must all be considered.

However, close cooperation between cardiologist and surgeon in the selection of cases does afford some hope for surgical relief for a certain number of these chronic invalids. While clinical cases in which symptoms are produced largely by pericardial fibrosis amenable to surgical treatment are not common, some are doubtless overlooked. Since the results of operation in certain carefully chosen cases are so remarkably good, the development of the complicated technic by a limited number of surgeons is highly desirable.

John Shaw Billings (1838-1913)

ON April 12, 1938, occurred the hundredth anniversary of the birth of a man whom Sigerist has properly designated as one who "truly ranks among the great pioneers of American medicine." The occasion was fittingly commemorated by a joint meeting of the Johns Hopkins Medical Society and the Johns Hopkins Medical History Club and the proceedings are set forth in the April issue of the *Bulletin of the Institute of the History of Medicine*, of the Johns Hopkins University, named the John Shaw Billings Memorial Number, covering 163 pages.

The life of this remarkable man in detail has been written by Fielding H. Garrison and was published in 1915. It is a classic and deserves to be read by all who are in any degree interested in the upbuilding of scientific medicine. It is the story of the accomplishments of a man who did more to strengthen and elevate his profession than has anyone else in its history.

To attempt to cover the same ground, even in condensed form, within the limits of an editorial, is manifestly impossible. Only the highlights can be mentioned.

Billings' career began simultaneously with the outbreak of the Civil War. At twenty-three he received his commission, served with great distinction throughout the conflict and remained in the army for nearly thirty-four years. This experience resulted in the initiation of four of his great accomplishments: he was responsible for the production of the monumental Medical and

Surgical History of the War of the Rebellion; he developed the Army Medical Library, the Army Medical Museum and the Index Catalogue, all tremendous undertakings.

In 1876 he was approached by the Trustees of the Johns Hopkins Fund and induced to submit plans for the proposed Johns Hopkins Hospital, in competition with others. His plans were accepted and he was intrusted with the supervision of the construction, all, of course, with the consent of the army authorities. Notable as this service was, it was even less important than the part Billings played in the organization of the school and the selection of the personnel. The plans he proposed were radical to the point of being revolutionary at that time, but they were adopted, and the sanity of his ideas has been vindicated and proven by the subsequent developments. Seldom has so much responsibility rested on the shoulders of one man and never has it been more thoroughly justified.

He was called on to design other important hospitals, like Peter Bent Brigham, and made notable contributions to the literature of military medicine, the history of medicine, public hygiene, sanitary engineering and statistics. He was the author, according to Garrison, of "the most critical account of American medical literature (1876) and the best history of surgery that has been published in English (1895)." "He was," says the same authority, "a man of all-round ability . . . (who) did a giant's work for the advancement of American medicine."

Billings had a good heredity, but his people were poor and he secured his education at Miami with difficulty and personal privation. His training in the Medical College of Ohio was the usual two-year course of that period and he served an internship, an uncommon thing in to do in those days, in an obscure hospital. There must have been giant stature, in his chromosomes, for he rose above these handicaps and left a heritage of almost unique accomplishment. Yet his name is scarcely known to the present generation. When Johns Hopkins is mentioned we think of Osler and Welch; the army suggests Beaumont, Sternberg, Reed and Gorgas; in medical history Sudhoff and Sigerist, all great and worthy men, but John Shaw Billings, quiet, self-effacing and competent, was the peer of them all, and without him

some of them would not have had their great opportunity.

He retired from the army in 1896 at the age of fifty-eight, having served for thirty-four years. His plan was to spend the rest of his days in Philadelphia doing research, writing and teaching in the University of Pennsylvania but the Fates ruled otherwise. The Public Library system in New York was in a state of flux, with three disconnected organizations serving the public as best they could. The services of a trained and capable coördinator were needed and Billings was the man. Reluctantly he gave up his long cherished plans, put on the harness for more public work, and in this harness he died in 1913. But he had done one more big thing in a quiet way; those "seventeen years . . . saw dreams realized in a way given only to those who deserve success." To him it was just the day's work.

G. C.

The College of Physicians and Medical Economics

THE program of the meeting of the American College of Physicians which was held in New York last month included at least two speeches which had nothing to do with scientific medicine. The presidential address by Dr. James H. Means took a slap at the attitude of the American Medical Association towards medical economic policies, and was widely heralded in the lay press as a revolt in the medical ranks of the country. The members of the College, to counteract any such impression, circulated a statement signed by 300 members, including President Means, denying that the College was in revolt against the organized medical profession. President Means' further remarks disparaging the importance of the present doctor-patient relationship suggest he has had little personal experience in the need of a doctor. His statement that "having a third party determine the size of, and even collect, the fee from the patient for the doctor is not only not an intrusion into the holy doctor-patient relationship but actually increases the likelihood of the patient's receiving from the doctor the best and wisest treatment the doctor is capable of giving" is hard to follow. If Dr. Means intends to convey the idea that collecting fees is distracting to the scientific practice of medicine, he is right. If, however, the majority of patients and practition-

ers prefer the present patient-doctor relationship to any other system so far offered, there is good reason to hold to our present system.

The other address by Dr. John P. Peters, professor of medicine at Yale University Medical School, was what one might expect from the secretary of the so-called "Committee of 430" doctors. The Committee having once declared itself in favor of more government influence in the practice of medicine, its secretary again makes a plea before the College for government subsidy for medical schools, hospitals and laboratories. He thinks the rich do not pay to support the institutions that care for the indigent, and yet enjoy medical advances developed through the instrumentality of the indigent. He infers the rich do not pay taxes and that the indigent are used as guinea pigs for experimentation. He makes a plea for government subsidy for the productive phases of medicine developed by educational and research institutes and hospitals and distrusts the vagaries of philanthropists. Government direction, in his opinion, could be no worse. It is our impression that most of the advances in our country in medicine, as in other fields, have in the past been accomplished by private enterprise. Any advances that have been made in the Yale Medical School were made possible by the large endowment of Yale University, which was accumulated largely from gifts from the wealthy. On the whole, the speech resembles some we have recently heard from Washington, which have sounded like an attempt to accentuate class antagonism. Perhaps the speaker belongs in Washington.

Proposals for changes in policies regarding medical practice, education and research should properly be initiated within the ranks of our national organization. Activities of societies of specialists should be limited to scientific discussion. Our organization is a representative one and it is wiser to leave the disposition of medical problems to our chosen representatives.

Correction

The widespread report that Professor Moritz Oppenheim was one of several medical men of Vienna who had committed suicide was repeated in an editorial entitled "Nazi Persecution in Vienna" which appeared in our columns last month. This was an error which we take pains to correct. Professor Oppenheim is still alive, a fact which will be welcomed by many professional friends in this country.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association

B. J. Branton, M. D.
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The State-Wide Survey

Has your county society started its survey of medical care and facilities in your own community? If not, the work should begin at once.

This survey, which means so much to the future of medicine in the United States, is being carried on in every county in the state. It is essentially a COUNTY SOCIETY SURVEY. Every member must do his part.

HAVE YOU DONE YOURS?

Study Under Way

Preliminary steps have now been taken for the state-wide survey of medical facilities by medical societies in Minnesota.

The first was an all-day meeting, Sunday, April 3, in Saint Paul, of the Committee on Medical Economics—chairman, W. F. Braasch, Rochester—where the following plans were formulated.

The Committee on Medical Economics, functioning through the Sub-Committee on Low Income and Indigent Problems, of which Dr. Coventry of Duluth is chairman, will have general supervision of the survey. It seemed best to group the county activities according to Councilor Districts, under the direct supervision of the respective councilors, who are familiar with the various local situations. In order to co-ordinate these state-wide activities the State Office of the Minnesota State Medical Association will assist county and district officers of the survey where it is needed and collect information required from state-wide health and welfare agencies.

It cannot be over-emphasized, however, that this survey is the individual problem of every county medical society, club, or district society in the State Medical Association. No one man

or group can be held responsible for the success of this campaign. It must be a coöperative movement—a share the work plan.

Help in Fact Gathering

Both state-wide and local welfare agencies will be asked to assist in gathering facts for the study. They will also be asked for their candid opinion concerning the adequacy of medical care in each locality and what suggestions they may have, if any, on practical means to improve it.

Dentists, pharmacists, social welfare workers, nurses, hospital executives, health officers, all will be asked to contribute to this study to the end that it may be authentic, accurate and comprehensive—and to the end, also, that no one can attack it, when the work is done, on the ground of prejudice or insincerity.

Preliminary Meetings

Preparations are now going forward in nearly all councilor districts for preparatory meetings of physicians to insure interest, information and enthusiasm for the work. Such meetings have already been held in district three under the direction of Councilor B. J. Branton of Willmar, in district five under the direction of Councilor George A. Earl of Saint Paul, in district two under the sponsorship of Councilor L. L. Sogge of Windom, and in district eight under the direction of Councilor W. L. Burnap of Fergus Falls.

Conferences have been arranged with the Governor, with Mr. Herman Aufderheide, director of the State Relief Agency, Mr. C. R. Carlgren, chairman of the State Board of Control, Mr. W. R. Sassaman, executive secretary of the State Planning Board. Arrangements have been made also for a general conference with state officials of the welfare and professional organizations whose interests involve care of the sick.

Forms to be Filled

Eight forms have been provided for the survey by the Bureau of Medical Economics of the American Medical Association to be filled out under the direction of the county societies and by individual members. A ninth form, not yet ready, is to be used to summarize the information secured on the others in each county. Copies of this summary will go to the State Office and to Chicago; one will remain with the county society, club or committee in charge of fact-gathering. A tenth form is to be supplied to state organizations for securing information of a state-wide character.

Work to be Pushed

The survey is to get under way at the earliest possible date and county officers are urged by the chairman in charge to make it their most important job until the work is finished.

Following are important talks on the subject given at the Sunday meeting by Dr. R. G. Leland, director, Bureau of Medical Economics, American Medical Association, and Dr. R. E. Scammon of the University of Minnesota, president of the State Planning Board:

DR. LELAND

You have no doubt heard it said that the survey of medical facilities initiated recently by the American Medical Association represents a change of front on the part of the association. You have heard, perhaps, that, confronted with criticism, with threats of legislative action, and with a demand for action on the part of the U. S. Public Health Service, the American Medical Association has at last been forced to form a positive policy and take action.

Nothing could be farther from the truth.

Policy Unchanged

It was sixteen years ago when the American Medical Association first announced its policy on health insurance. At that time the association went on record as officially opposed to health insurance except and unless it was organized and sponsored by local county medical societies. It has never deviated in any respect from that policy; but in 1935 the House of Delegates of the national body drew up the now famous Ten Points which definitely set out the principles that should be followed in any system for distribution of medical care, including health insurance. Later the American Medical Association specifically encouraged the formation of local community plans of various sorts, where they were needed and where they were under medical society sponsorship, for better distribu-

tion of medical care to low income groups. Many such plans were started in various parts of the United States with the advice and the assistance of the Bureau of Medical Economics of the association.

No Response

In 1937 after rejection of the proposal brought to the House of Delegates at Atlantic City by the New York State Medical Society for federal subsidy for care of the indigent, a resolution offering to confer with any qualified government agency on new plans for medical care in the United States was passed. Up to December, 1937, no agency had made any effort to take advantage of this offer.

In December, 1937, the United States Public Health Service and representatives of the American Public Health Association did approach the Board of Trustees for a conference on the matter and the plan for a survey of medical care by the practicing physician in his county society was formulated.

New Method

The American Medical Association has always been deeply interested in the public welfare. The survey represents, merely, a new method for attacking the problem of public welfare, not a new interest in the problem of care for the sick. It represents, also, the first time that medical men have ever been asked to make a study of medical problems.

A Medical Problem

Our survey should be regarded as the first step toward adjustment of our system of medical care to the changes of our times. I should like you to regard it, also, in the light of a medical problem.

The first step in the study of a medical problem is the collection of data; the second is a diagnosis based on the data collected; and the third is a recommendation for treatment.

This survey will be effective only if we handle it according to these three steps and in the light of a strictly impartial medical analysis.

Not "Just Another Study"

It cannot be too strongly emphasized that this is not a study to be made and forgotten. We medical men must work with public agencies to make whatever changes are necessary to keep in step with the changes of the times. The survey will provide us with the facts we need in order to make those changes effective.

The American Medical Association has been much criticized because "it had no plan." We have always had a plan. Our plan has consisted of an effort to make hundreds of plans, if need be, to fit every local community because no plan on earth could be made to fit every section of the United States. The object of this survey is to fit our plans, if they are needed, to the needs of the local community.

Is Obstacle Economic?

There is a wide-spread belief that an obstacle exists between physician and patient. We must find out just how real and how extensive this obstacle is and what is its cause. Is the obstacle wholly economic? Is it rooted partly in ignorance and lack of special health education? These are questions we must answer and problems that we must try to solve.

The effort need not be costly to the individual county society. It may require time and sacrifice on the part of some of you; but I hope you will carry it through to the conclusion, no matter what it costs. We must keep in mind that the medical profession is under fire of much criticism; we must keep in mind, also, our own objective, which is and always has been, the best possible medical care for all the people.

DR. SCAMMON

It has seemed to me as I have listened to the outline of your plans that this survey is going to be exceedingly valuable. Indeed, I'm not sure that I shouldn't go further and say that this survey is essential.

In the first place, the survey is tied up with the medical profession. And it is the doctors and the doctors, alone, who are in a position to evaluate the character and nature of the services needed.

In other countries where attempts have been made to reorganize medical care, the task has been done without the assistance of the medical profession. The results were almost invariably unfortunate until, after a period of time, the medical profession was called in to help. We have many examples of this sort of planning from above—and without the doctors—for medical care.

Wasted Years

In England, health insurance was worked out from above in a period of three months. It took twenty-five years of modification to get that original scheme down to a workable plan. If the medical profession had been called in in the first place a quarter of a century of effort would not have been wasted.

In the second place, this survey and resultant plans are to operate by taking small areas as units and working out problems individually there.

Here in Minnesota we have 87 counties. Some are growing, some are declining in population; some are urban, some are rural; some are prosperous and some are not. We are not faced with a simple problem when we undertake to study and adjust medical care in Minnesota.

We Must Have Patterns

It is therefore extremely important in my estimation to go at this problem in the manner suggested by this study. We must get a pattern for each state and for each locality of the state; and this is the only way to get it.

On some of the blanks provided for this survey you will, of course, not get a perfect return. This fact

should not constitute a cause for criticism. It is a fact that very few large surveys get a perfect return. Even insurance companies are unable to get them. It is possible on the basis of incomplete returns, however, to indicate "zones of confidence" in the returns. A process of cancelling out and evaluating will get at satisfactory answers in the end.

Choice: Data or Guessing

We never get anywhere at any constructive work without data. We must not expect that our results will be perfect; some variability is to be expected but this variability does not invalidate the usefulness of our attempt to collect facts.

The results of this survey may be merely a sampling. But we elect officers on a sampling process; not on the basis of a full vote. We have the choice of collecting data or of guessing. We can get the facts with a certain limit of error. And our best protection is certainly to work from information, even if it is not perfect, rather than from guessing. The public is best served where the medical profession takes the trouble to know where it stands.

DR. LELAND

Preliminary Preparations

The importance of preliminary organization for the survey cannot be over-estimated.

We must impress upon the individual medical man that this is "a medical analysis by medical men," that he, himself, is the only one who can push it through to a successful finish. We must not approach our task with a bias, either, or a preconceived notion that something must be done or that one plan or another is right or wrong, regardless. In some counties nothing needs to be done to improve distribution of medical care. We know that. But even in these counties we must have the information before we can safely come to such a conclusion.

By all means we should make use of findings of other organizations when we have reasonable assurance that the findings are accurate and honest.

For Accurate Sampling

I am very grateful to Doctor Scammon for his comments on the survey. Our findings will be samplings, only, as he told you. They will not be 100 per cent perfect nor will they lend themselves to mathematical statistical studies. But we must make an effort to have accurate sampling for all classes in a vertical rather than in horizontal lines. We must try to show the levels of service. Where osteopaths or chiropractors give a large amount of service, for instance, note should be made of the fact on the proper forms.

Community Project

We shall have failed seriously unless the confidence in the medical profession is in the crescendo as the study proceeds rather in the diminuendo in our communities. Our associates in the survey must be willing

to go along with us, not only in getting information but in carrying out the recommendations that result.

In Michigan the survey is already underway. The governor gave his blessing, appropriated \$10,000 to it and plans to use the results for purposes of his own.

In Pennsylvania where the study is also advancing rapidly, the work has been parcelled out by districts to members of the Committee on Medical Economics.

However you plan the details of the work in Minnesota, you must not fail to ask yourselves when it is completed: has every man had his day in court? If he has not, suspicion of prejudice and suppression of fact will defeat the purpose of the survey and render the work of no avail.

Forms Ready

The forms for this study were printed by the American Medical Association and all but two or three are ready for use. Of these last, one is for pharmacists; and one for state medical societies to record information from state agencies and state-wide health services. Summary forms for the county societies still remain to be supplied. On these summary forms each county society will be asked to summarize the information secured on the other eight forms. The county society will then keep the original forms from which the summary is made and make three copies of the summary, one for the state association, one for the American Medical Association and one for the county society.

The returns on Form 1 (on volume of free and paid for service of each physician, etc.) are to be anonymous; but a key method of some sort will doubtless be needed particularly in the large societies so as to know how many have sent in their returns.

To Every Man His Chance

Publicity will have to be carefully controlled. The first announcement that the medical profession of the state is going to make a survey of medical care in each county will be news. A brief statement of the purpose of the profession in making the survey will suffice for this story. Publicity thereafter should be confined to state journals and special bulletins and talks to the profession until the survey is completed and we are ready to tell the public what we propose to do about it.

Whether to go to non-members for information is a question to be determined by each society. You must always remember, however, that when the survey is over everybody must have had his say. We must not leave the door open to criticism by anyone, even non-members. Give everybody his chance in this survey, be he friend or foe.

Medicine in Charge

The power of a medical organization which acts as a unit to preserve essential values of medicine and to serve the public interest is well demonstrated in two spots in America today.

One is in British Columbia where a Health Insurance Act was drawn up with the aid of physicians several years ago and was so emasculated in passage that the physicians flatly refused to function under it. As a result of that refusal there is health insurance in name only in British Columbia, pending the passage of a new act which will meet with the approval of the medical men.

Washington Controversy

Illustration Number Two is to be seen today in the District of Columbia where the Group Health Association plan for employees of the Home Owners Loan Corporation has become focal point for conflict and newspaper attack.

As noted before in these columns, the Home Owners Loan Corporation received a grant of \$40,000 from the government to enable it to start this group sickness insurance plan for employees of the corporation. The Comptroller General of the United States subsequently ruled that the grant was illegal; the House Appropriations Committee indicated its disapproval.

Declared Illegal

The United States district attorney of the District of Columbia ruled that the association is unlawful under the Healing Arts Act of the District of Columbia which declares that it is unlawful for any corporation to practice medicine. The corporation counsel also ruled that the Group Health Association is operating in violation of the insurance laws of the District of Columbia.

With tacit Administration approval the association persisted in its organization and operation in spite of these rulings. Six physicians were hired to take care of the 6,000 members of the association.

The complete history of the opposition of the District of Columbia Medical Society as it was outlined by Congressman Shafer of Michigan and published in the *Congressional Record* of Tuesday, March 29, is as follows:

When the scheme was first broached, the medical society offered its coöperation in good faith to help provide the medical care. There was only one proviso: that the program to be worked out should not violate the legal, ethical and professional standards of the society.

Six for Six Thousand

It should be obvious to anyone that a plan whereby six physicians are hired to care for 6,000 people, the original grant for which was declared illegal by the Comptroller General and the plan of operation for which was also declared illegal both under the Healing Arts law and the insurance laws of the District of Columbia, could not comply with the standard set by the District of Columbia Medical Society.

The Society accordingly ruled that its members could not participate in the plan because it involved the illegal practice of medicine. And when one of them accepted employment from the Group Health Association and refused to resign his job, the Society dropped him from membership.

Hospitals are naturally bound by the same standards as the medical society and they were also unable to maintain professional relationships with physicians who were engaged in medical practice that violated the law.

Test Cases

The physician dropped from membership is reported to have threatened suit against the Society, of course; also a test case involving a Group Health Association member and physician and one of the hospitals inevitably developed. This case was seized upon and touted for all it could be made to yield as a weapon against the Society.

The episode was shouted in the newspapers and a member of Congress from California hastened to introduce a resolution into Congress for an investigation, not only of the District of Columbia Medical Society, but of all constituent societies of the American Medical Association and the national association itself.

Resident Vindicated

The truth of the hospital episode was this: An appendicitis patient was sent to the hospital for operation by one of the Group Health Association physicians. The patient was informed that her association physician was not permitted to practice in the hospital but that she might call any other physician or surgeon whom she chose. She refused and left the hospital to be operated upon, two days later, in another hospital, and by another physician. Her appendix, at the time of operation, showed that her condition was not acute. As the resident at the

first hospital had originally declared, the case was not an emergency and he was not under obligation, therefore, to violate hospital rules to allow the operation.

The story told by the California congressman varied considerably from the facts and great capital was made of her dismissal from the hospital. In fact, it was noisily and erroneously reported that the appendix had ruptured after she left the first hospital and before operation.

Situation Precarious

As a result of the resolution and firmness of the Medical Society of the District of Columbia, the situation of the Group Health Association remains highly unsatisfactory and precarious. Only six physicians have so far been employed under it and these six physicians are not permitted to care for their patients in any reputable hospital in the District.

It is clear here, as in British Columbia, that the physicians themselves can control standards of medical care anywhere in the United States if they work together to maintain them.

In this connection it is important to make a note here of the fine address on the subject made in the House of Representatives by Congressman Shafer.

Champion in Congress

Said Mr. Schafer in the conclusion of a talk in which he reviewed the known facts of the Group Health Association controversy:

"In accusations of this kind (concerning the patient whose physician was refused permission to operate in the hospital) it is better to have the facts established immediately than to allow the medical profession to be exposed to loose charges. I have no doubt that an investigation would vindicate members of the District of Columbia Medical Society completely and for that reason I would support the resolution of the gentleman from California if it were not national in scope. . . . I am at all times ready to favor an investigation into charges against the medical profession or any of its reputable members because I believe that, except perhaps in isolated cases, such charges are idle gossip which would be disproved by an orderly investigation, and because I believe the medical profession is too important, its ideals are too fine, its service to humanity is too great and its necessity to human welfare too vital to allow it to be rendered suspect. I believe the members of the District of Columbia Medical Society whose conduct has been brought into question should be given full opportunity to establish in an orderly and convincing way the falsity of these charges."

Behind the Headlines

The American College of Physicians, a purely scientific association, was considerably startled, recently, to find its regular scientific meeting had been made the occasion for an entirely unsanctioned outburst of propaganda for the Committee of Physicians.

The first explosion was set off by Dr. John P. Peters of Yale, secretary of the now famous committee which released its proposals for Federal subsidy of medicine with considerable trumpeting in the lay press last November. Doctor Peters spoke before the College of Physicians at the personal invitation of Dr. James H. Means.

"Advantage of the Rich"

Said Doctor Peters:

"The practicing physicians offer solutions for health problems that overlook the production side (medical schools, hospitals and laboratories). Meanwhile the medically productive institutions are reduced more and more to philanthropy for their funds. . . .

"It is my impression that the government alone can assume the burden of providing, maintaining and correlating the necessary medical resources. . . .

"It is rather amusing to reflect that, at the present time, most of the advances in medicine which the rich enjoy are developed in hospitals and institutions through the instrumentality of indigent patients. The fees which the rich pay, however, do not return to the support of those institutions but go to the practitioner who is exploiting new medical discoveries. . . ."

Released in Advance

This interesting declaration received the sort of newspaper attention that such a paper always gets when it is given by a man who occupies a prominent place—and who hands his paper to the newspapers plenty of time in advance.

The second charge came from the retiring president, Dr. James H. Means of Harvard University, himself.

This time the American Medical Association was directly assailed as maintaining an attitude "close to standpatism."

"Like Jove on High Olympus"

"The behavior of the association is political," said Doctor Means. "It is partisan behavior; it champions a cause. At the present time the cause is something close to standpatism.

"But the policy can be changed at any time if the membership wills it. At the present time the membership of the American Medical Association is apathetic and inarticulate because it has no issues, no platforms set up to vote for.

"It is allowing the medical politicians to run things about as they please and official spokesmen, like Jove on high Olympus, hurl thunderbolts of wrath at all who differ in orthodox doctrine.

"As no democracy can be healthy without freedom of speech, real issues and an effective opposition party, it is desirable that those who believe in popular government bestir themselves to change this state of affairs."

Resentment Boiled

The effect of this well-timed challenge upon younger members of the College was electric, according to Minnesota representatives.

Resentment boiled up in all quarters. There was a general demand that the issue be thrashed out on the convention floor but wiser council prevailed.

Instead, a resolution was drawn up as follows and presented to the regents:

"Unfortunately an impression has been given to the press that the American College of Physicians is in revolt against organized medicine as represented by the American Medical Association.

"Inasmuch as the College has never taken any action, and inasmuch as we have reason to believe that this reported impression does not represent the opinion of the majority of the members of the College, we, the undersigned Fellows of the College, respectfully request the Board of Regents to correct this impression publicly."

Means, Signer

In the midst of a busy session, 400 signers to this petition were secured in the space of two hours. One of them, ironically, was said to be Doctor Means, himself.

An answer from organized medicine was immediately forthcoming. Said Dr. Morris Fishbein in a Chicago address the next night:

"Doctor Means has never taken any actual part in the affairs of the American Medical Association and his ignorance of what is going on is actually lamentable.

"If he had any real knowledge of the present activities of the association which include a nation-wide inventory of medical needs and a determination of the means for satisfying them, he could not have spoken as he did. . . .

"Dr. Means is, unfortunately, typical of a considerable number of physicians in laboratories or in full-time positions in medical schools who are unaware of medical practice outside of public hospitals or clinics.

Confiscatory Taxation is the Answer

"They have one chief objective . . . the securing of more and more government funds for the subsidizing of medical education, of hospitals and of the care of the sick.

"Their answer to the problem of medical care . . . is confiscatory taxation of industry and of the individual worker for the benefit of a bureaucracy."

To all of which Doctor Means issued the following meek statement in extenuation:

"I wish to correct a misunderstanding. It has been said that I am advocating a revolt against the American Medical Association. I am not advocating a revolt and nothing of the sort was mentioned in the speech which I made last night. What I did was to express the opinion that it would be wholesome if there should develop an enlightened opposition party within the democracy of the American Medical Association. This would be merely democracy functioning in a normal fashion."

Indignant Telegrams

It is reported, incidentally, that Doctor Means was promptly flooded with telegrams from all parts of the country—and that the prevailing tenor of these telegrams was indignation and a general demand for an explanation.

The real criticism of Doctor Means was not that he should hold opinions or that he should express them but rather that he should have expressed them when and where he did. The keenest resentment of all was expressed by College members who felt that they, a purely scientific body, had been placed in a false and unpleasant light before the country.

Silence Unfortunate

The whole episode gives rise to one obvious conclusion. The constituent state medical associations that make up the American Medical Association must hereafter vigorously express themselves on matters of economics, social welfare and the future of American medicine.

That the American Medical Association reflects the will of its constituent associations through their representatives in the House of Delegates is clear to anyone who is at all familiar with the sentiments and deliberations of this body. Under the Constitution the Board of Trustees must necessarily carry out the policies of the House of Delegates where such policies are clearly defined.

There is no doubt that a deliberate effort has been made by certain groups and agencies to promote a general impression that the American Medical Association does not truly represent organized medicine. These groups and agencies may be classified in a general way under the following headings: First, individual doctors

who are not personally satisfied with the policies of the *Journal of the American Medical Association*; Second, politicians and others who want a complete change of method in the administration of medical care in the United States; Third, the patent medicine and proprietary medicine interests whose toes have been stepped on by the Council of Pharmacy and Chemistry; Fourth, the popular and ever growing number of throw-away medical publications supported by medical houses and exploiting uncensored medical advertising.

Knowledge—Judgment—Opinion

(Monthly Editorial Prepared by the Medical Advisory Committee)

Life to everyone is a contrast of emotions or thoughts.

To the child happiness, a smile, is easily changed into despair, a tear. The business man becomes a thinker in pessimistic or optimistic terms according to the stock market. The economists think in terms of supply and demand. They write volumes on their theories pro and con. The physician must make a diagnosis through scientific research before he can prescribe a treatment to cure or alleviate human suffering.

Your Medical Advisory Committee believes also that before a medical man endeavors to give an opinion about the results of others there are certain correlated facts that must be taken into consideration.

As a consultant or an expert he must have an extensive knowledge of the truths involved before he can pass sound judgment, which is the mental faculty of deciding correctly by the comparison of facts and ideas. His opinion then is worthy of consideration.

Too many of us in judging another man's work are inclined to do so hastily without study or reasoning. By giving erroneous opinions based on a lack of knowledge, and therefore faulty judgment, we start a large number of malpractice cases each year in Minnesota.

If without Knowledge, and hence lacking sound Judgment, we attempt to give correct Opinions and fail, the shame is ours and the results must be disastrous to the members of our profession.

Minnesota State Board of Medical Examiners

Self Styled Dutch Scientist Found Not Guilty by Duluth Jury

Re: State of Minnesota vs. Martin W. Pretorius.

Following a trial lasting three days in the District Court of St. Louis County, Martin W. Pretorius was found not guilty by a jury of eight women and four men. The defendant was charged, in an information filed by Thomas J. Naylor, County Attorney of St. Louis County, with practicing healing without a basic science certificate. The presiding judge was the Honorable Edwin J. Kenny.

Pretorius was arrested on July 14, 1937, at the Hotel Duluth where he was representing himself as an "Eminent South African Dutch Scientist—Hollywood Publisher—Newspaper Columnist and National Authority on Corrective Feeding and Body Culture." Pretorius represented himself as the founder and director of the Food Chemistry Educational Institute, Box 1857, Hollywood, California. Pretorius' method of operation was to give a number of free so-called health lectures during which people were solicited to take a so-called Martin Pretorius Home Study Course in Food Science and Rational Living. The cost of this course was represented as being \$15.00. The pamphlet further stated that supplementary instructions would be given to "assist each student in solving their own health problem." * * * "Please indicate the conditions in which you and the immediate members of your family are particularly interested by placing an 'X' in the square provided." Then followed a list of eighty diseases and conditions including Bright's disease, cancer, epilepsy, tumors and tuberculosis.

According to the Clerk of the District Court of Atlantic City, New Jersey, one Martin W. Pretorius pleaded guilty on February 11, 1930, to practicing medicine without a license and was fined \$200.00. Pretorius did not take the witness stand in his own defense, nor did he call any witnesses in his behalf. The defendant probably was aware that he would be questioned, in the event he took the witness stand, with respect to his educational qualifications, as well as his scientific attainments. It is interesting to note that when the State had completed the presentation of its evidence and a motion was made by the defendant for a dismissal of the charge on the grounds that "the evidence is insufficient to sustain the allegations of the complaint" and that "the facts proven are insufficient to constitute and show the commission of a public offense," the motion was denied after careful consideration by Judge Kenny. This shows that the Court was satisfied that the evidence was sufficient to sustain the allegations of the complaint and that the facts proven were sufficient to constitute and show the commission of a public offense.

The case was well tried for the State by Mr. Victor H. Johnson, Assistant County Attorney of St. Louis County. The defendant was represented by Mr. Jenswold of the law firm of Jenswold and Dahle.

Saint Paul Osteopath Removes Designation of "Aurist"

Re: Samuel M. Stern, D.O.

Following a complaint made to the Minnesota State Board of Medical Examiners that one Samuel M. Stern, a licensed osteopath with offices at 512 Hamm

Building, Saint Paul, was using the designation of "Aurist" on his door and stationery, an investigation was made of the matter by the Medical Board. A careful study of the osteopathic law of this state and other authorities, convinced the Board that an osteopath is not entitled to use that designation in Minnesota. The Minnesota osteopathic law specifically provides: "The practice of osteopathy is hereby declared distinct from that of medicine or surgery * * *." The Minnesota law also provides that an osteopath cannot furnish medicine for internal use, nor can he do major surgery. The accepted meaning of aurist undoubtedly is a physician who specializes in the treatment of diseases of the ear without any limitation as to the scope of the treatment. It seems logically to follow that the term osteopathy by the very nature of its statutory limitations, cannot, and does not harmonize with the accepted version of the term aurist. The Minnesota State Board of Medical Examiners so notified Stern and after consulting with his lawyers, Stern removed the designation.

Wright County Optometrist Pleads Guilty to Practicing Medicine Without a License

Re: State of Minnesota vs. Benjamin E. Nelson.

On April 25, 1938, Benjamin E. Nelson, who maintains an office to practice optometry at Buffalo, Minnesota, entered a plea of guilty to an information charging him with practicing medicine without a license. Nelson entered this plea of guilty before the Honorable Leonard Keyes, Judge of the District Court for Wright County. After a presentation of the facts by Mr. Thomas P. Welch, County Attorney, and Mr. Brist on behalf of the State Board of Medical Examiners, Judge Keyes sentenced Nelson to a term of one year in the Minneapolis Workhouse. The execution of this sentence was stayed and Nelson was ordered to pay the costs of the prosecution, to refrain from practicing medicine and to report to the State Board of Parole.

Nelson was arrested on March 8, 1938, following a complaint being filed against him by Mr. Brist, attorney for the State Board of Medical Examiners. The investigation conducted by the Medical Board disclosed that Nelson, despite a warning given him in 1935, was practicing medicine by prescribing diet, furnishing medicine to patients and examining specimens of urine. Prior to being warned in 1935, Nelson's method of operating was to give patients slips of paper which were to be taken to Beutner's Drug Store at Buffalo. These slips called for formula No. 1, No. 2, No. 3, et cetera. After he was warned, Nelson did his prescribing by word of mouth rather than in writing.

A most unusual incident occurred in the final disposition of the case, Nelson being represented by Mr. C. S. Hawker, a lawyer of Buffalo, who also was the Justice of the Peace who issued the warrant for Nelson's arrest, and before whom Nelson was arraigned. Mr. Hawker described Nelson as an outstanding citizen of Buffalo, while Nelson himself attributed his prosecution to the jealousy of the medical profession. It is a rather strange thing, but some persons who are prosecuted for practicing medicine without a license, never seem quite fully to understand that the question before the Court is their guilt or innocence, and that by entering a plea of guilty, the facts speak for themselves.

The State Board of Medical Examiners wishes to acknowledge the splendid cooperation of Mr. Welch, the County Attorney. Mr. Welch promptly instituted a prosecution when the evidence, consisting of numerous bottles of medicine and other exhibits, was presented to him.

OF GENERAL INTEREST

Scientific Exhibitors

The gold medal of the Southern Minnesota Medical Association will be presented to the physician presenting the best exhibit of his work at the Minnesota State Medical Association meeting in Duluth.

This medal is presented annually as an encouragement to individual research by Minnesota medical men.

Dr. Donald Lowell Paulson of Rochester was married to Margaret Willius of Saint Paul, early in March.

Dr. C. E. Anderson of Brainerd has been elected chief of staff of St. Joseph's Hospital in Brainerd.

Dr. Henry Silver, formerly of Sebeka, has moved to Belview, where he will engage in the practice of medicine.

Dr. and Mrs. M. M. Hursh of Cohasset have returned from the south after enjoying a vacation of several months.

Dr. and Mrs. F. M. Manson of Worthington have returned from a southern trip which included a Caribbean cruise.

Dr. Jerome Scanlan of Minneapolis has moved to Pine City to become associated with Dr. A. K. Stratte in the practice of medicine.

Dr. Arden L. Abraham of Minneapolis has become associated with Drs. Gage Clement and J. R. McNutt of Duluth, in the practice of radiology.

Dr. S. W. Harrington of Rochester presided at the meeting of the American Association for Thoracic Surgery, which met in Atlanta, Georgia, early in April.

Dr. and Mrs. E. J. Kaufman, formerly of Appleton, have located in Anoka. Mrs. Kaufman is also a physician, and both will engage in the practice of medicine.

Dr. William Elliott, formerly of Newark, Illinois, has become associated with the Lenont-Peterson Clinic of Virginia. Dr. Elliott specializes in urology and skin diseases.

Dr. Carl D. Kolset, who has practiced medicine in Sanborn for the past thirteen years, has announced his retirement from active practice. His practice will be continued by Dr. R. J. Cairns.

Dr. L. E. Claydon of Red Wing has returned from a trip to South America. After spending three weeks on the Amazon he visited Peru, Ecuador, Colombia and Venezuela, taking moving pictures of various places of interest.

Dr. H. E. Michelson of Minneapolis addressed the Stutzman County Medical Society in Jamestown, North Dakota, at their annual meeting on March 31. A banquet was served before the meeting, and members from the surrounding societies attended.

The New York Academy of Medicine will hold its Eleventh Annual Graduate Fortnight October 24 to November 4, 1938. This year's session will be devoted to Diseases of the Blood and Blood Forming Organs. Those interested may write Dr. Mahlon Ashford, care of the Academy at 2 East 103rd Street, New York City.

Dr. A. E. Henslin of Le Roy, treasurer of the Mower County Society for more than fifteen years, was recently presented with a box of Nottingham cigars by the society members. Dr. Henslin has been incapacitated since January, due to a frost-bitten toe, but expects to have recovered in a few more weeks.

Dr. John L. McKelvey, at present a professor in the Peiping Union Medical College, China, has been appointed head of the department of obstetrics and gynecology at the University of Minnesota to take the position held for many years by Dr. Jennings C. Litzenberg, who will retire this spring. Dr. McKelvey was born in Kingston, Ontario, and is a graduate of Queens University.

The Board of Regents announces a gift of \$10,000 from Mrs. John Dwan, the mother of Dr. Paul Dwan of the Department of Pediatrics, for the inauguration of a serum center at the University of Minnesota.

The Board of Regents also accepted a gift of \$7,300 from the Citizens Aid Society of Minneapolis for the purchase of an additional Roentgen Therapy machine for the Cancer Institute.

Dr. R. M. Wilder of Rochester attended the meeting of the American Institute of Nutrition in Baltimore early in April, and conducted a round table discussion on diabetes at the meeting of the American College of Physicians in New York. He also addressed the meeting of the Postgraduate Assembly in Danville, Pa. Dr. Wilder will also attend the meeting of the Association of American Physicians in Atlantic City early in May, and will deliver the Mary Scott Newbold lecture before the College of Physicians in Philadelphia.

OF GENERAL INTEREST

The Journal of Neurophysiology made its debut in January of this year. Its purpose is to concentrate in one periodical, experimental work on the functions of the nervous system, peripheral and central. Appearing bimonthly, contributions will be selected four weeks prior to publication, contributions not chosen to be returned to the author. This method will assure prompt publication of the important experimental work being done in this field. The editorial board consists of J. G. Dusser de Barenne and J. F. Fulton of Yale, and R. W. Gerard of Chicago. The publication is of particular interest to our readers in that Dr. Fulton, a former resident of Saint Paul, is a member of the editorial board. The publication doubtless fulfills a long present need and has our best wishes for its success.

* * *

Dr. Carl C. Chatterton last month was awarded the International Distinguished Service Medal for 1937 by the Cosmopolitan Club of Saint Paul. The medal is given each year to a resident of the city who during the past twelve months has rendered outstanding and unselfish civic service without remuneration. It is, of course, a recognition of Dr. Chatterton's services rendered crippled children at the Gillette State Hospital. For twenty-seven years he has been associated in this work and since Dr. Gillette's death has directed the policies of the State Hospital for Crippled Children. Dr. Chatterton has also shaped the policy for the Federal Social Security service in Minnesota in so far as it relates to crippled children and the set-up in this state is conceded to be the most efficient of any state.

* * *

Medical Department Reservists

The annual postgraduate course and clinical conference given by the Clinics in St. Louis for Reserves of the Medical Department of the United States Army will be held May 23 to 28, inclusive.

The regular enrollment fee of \$10.00 is waived for Reserve Officers and the only expense will be a fee of \$2.50 to cover the cost of the dinner honoring the Corps Area Commander and the cost of incidentals.

Appropriate military credits will be given for attendance.

* * *

Tenth Anniversary Medical Broadcast

Dr. William A. O'Brien gave his 520th weekly radio talk over WCCO, under the auspices of the Minnesota State Medical Association, Saturday, April 2.

The occasion marked a milestone in radio broadcasting in the Northwest, particularly in the use of radio for health education, and it was noted by a special tenth anniversary broadcast at the regular program hour on Saturday, April 2, by Dr. J. M. Hayes of Minneapolis, president, and Dr. R. M. Burns, of Saint Paul, chairman of the radio committee of the Association, and by Max Karl, director of education for station WCCO.

A luncheon followed at which Doctor O'Brien was guest of honor and to which leaders in medical and health education and in radio activities in Minnesota

were invited. Among the speakers at this luncheon for which Doctor Burns acted as toastmaster were H. A. Bellows, station manager for WCCO at the time when the program began, Doctor Hayes, Dr. B. J. Branton of Willmar, R. R. Price, director of the extension division and chairman of the radio committee of the University of Minnesota, and many others.

Over the air and at the luncheon, physicians and experts in radio extended their congratulations to Doctor O'Brien and his sponsoring association and paid tribute to the unique radio gift of Doctor O'Brien which has enabled him to continue the program with continuously increasing popularity for this record period of years.

The Minnesota State Medical Association program, with Doctor O'Brien as speaker, was hailed as a model of its sort and acknowledged as one of the pioneers in educational broadcasting.

Radio officials pointed out, among other things, that Doctor O'Brien is accorded the unusual privilege of speaking only from notes rather than from a censored manuscript and that this faculty for talking spontaneously and directly to his listeners had much to do with his personal popularity as a speaker and teacher. Physicians pointed out that Doctor O'Brien, in all his years of regular broadcasting, had never veered from the standards of accuracy and medical ethics set for its public education program by the State Medical Association, that he had worked conscientiously with practicing physicians with whom his listeners discuss the broadcasts and that he had assisted materially in keeping medical men alert to new developments in practice.

The weekly program hour is now Saturday at 9:45 a. m.

Hospital Notes

Dr. C. I. Krantz of Duluth has been named chief of staff, and Dr. J. H. Peterson, secretary, of the Hearing Hospital, Duluth.

* * *

Minnesota Hospital Service Association

On the evening of April 18, the Minnesota Hospital Service Association held a dinner meeting to which were invited individuals from various Twin City activities to commemorate the occasion of the approval of the Association by the American Hospital Association. The Minnesota Association was one of thirty-eight throughout the country to receive this approval, and the only one in the state.

Mr. A. G. Stasel, Superintendent of Eitel Hospital in Minneapolis, and president of the Association, presided and paid tribute to the group of Saint Paulites who had the temerity and perseverance to initiate the Association, which began its activities in June, 1933, as the Saint Paul Hospital Association, and in 1935 adopted its present name when the Minneapolis hospitals joined. Today

(Continued on Page 351)

MINNESOTA MEDICINE

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR MAY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 9:45 o'clock every Saturday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

- May 7—Sun and Air
- May 14—Research and the Hospital
- May 21—Periodic Health Examination
- May 28—Protective Foods and the Teeth

MEDICAL SEMINAR ASSOCIATED HARVARD CLUBS

The Medical School Seminar at the 41st Annual Meeting of the Associated Harvard Clubs to be held at the Palmer House, Chicago, Illinois, on May 20, 21 and 22 next, promises to be an outstanding feature of the meeting. It will mark Dr. Burwell's first visit to Chicago in his official capacity as dean. The program is as follows:

The Harvard Medical School in 1938..... Dr. C. SIDNEY BURWELL, Dean and Research Professor of Clinical Medicine.

Trends in Pre-clinical Teaching Dr. A. BAIRD HASTINGS, Hamilton Kuhn Professor of Biological Chemistry.

The Tutorial System in the Harvard Medical School..... Dr. WALTER BAUER, Associate Professor and Tutor in Medicine.

The Surgical Curriculum of Today..... Dr. ELLIOTT C. CUTLER, Moseley Professor of Surgery.

Discussion by..... Dr. JOSEPH T. WEARN, Professor and Head of the Dept. of Medicine, Western Reserve University, Cleveland, and Mr. LAIRD BELL, Chairman of the Educational Committee, Board of Trustees, University of Chicago.

The Seminar will begin about 2:30 p. m. on Saturday, May 21, immediately following a joint luncheon of all the schools beginning at 12:30 p. m., during which Frederick Roy Martin and William Allen White will speak briefly.

All graduates of the University are invited to attend. A limited number of admission cards are available for non-Harvard men who are particularly interested in medical education. These may be obtained by writing to Willard O. Thompson, M.D., Chairman of the Medical School Committee, 700 North Michigan Avenue, Chicago, Ill.

THE STATE MEETING

The 85th annual meeting of the Minnesota State Medical Association will be held in Duluth at the Hotel Duluth just before the Fourth of July holidays and therefore holds a special appeal this year, not only for those who are attracted by the distinguished scientific program but also for those who want to combine attendance at the meeting with a pleasant vacation in Northern Minnesota.

Unusual extra-meeting activities have been arranged for both the physicians and their wives so as to take full advantage of the place and time of meeting. One is the golf tournament to be held Saturday morning, July 2, following the close, Friday afternoon, of the scientific sessions. Another is the long boat trip on one of the big lake boats leaving the docks early in the morning and returning after luncheon in the afternoon.

The scientific session and exhibits, alike, are designed by the Committee on Scientific Assembly to be of value especially to the busy general practitioner. Emphasis is laid upon improved methods of treatment for conditions encountered in daily practice rather than upon the exceptional problems of medicine.

Among the interesting entries in the exhibit section is the prize-winning fracture exhibit of the Mayo Clinic, the exhibit on treatment of syphilis from the American Medical Association, the demonstration of pneumonia treatment by the Minnesota Department of Health and the demonstration of a simplified method of blood transfusion from the Department of Surgery of the University Medical School. In addition there will be daily lectures on diabetes at the exhibit and demonstration hours by the Committee on Diabetes and many other important exhibits by individuals and institutions, including an entire section devoted to scientific work of Duluth members and institutions.

Dr. Howard Haggard of Yale heads a distinguished list of guest speakers which includes Dr. Irvin Abell, president-elect of the American Medical Association; Dr. Roland Cron of Milwaukee; Dr. Hollis Potter of Chicago, who will give the annual Russell D. Carman lectureship; Dr. Edward Jackson of Denver; Dr. Philip Lewin of Chicago and Dr. Karl Meyer of Chicago; Dr. E. K. Marshall of Johns Hopkins and Dr. C. Anderson Aldrich of Winnetka, Ill.

For the medical economics section scheduled for Friday morning, July 1, from 11 a. m. to 12, the speakers will be Dr. J. M. Hayes, Minneapolis, president of the association, who will give his presidential address at that time; Chief Justice H. M. Gallagher of the Supreme Court of Minnesota and Mr. S. B. Houck of Minneapolis, representing the Minnesota Bar Association.

The first Herman M. Johnson memorial lecture will be given at a luncheon meeting to be held at the hotel Friday noon. Governor Elmer A. Benson, long a friend

IN MEMORIAM

of Dr. Johnson and well acquainted with his work, will be the lecturer.

Dr. Haggard will give the principal address at a public health meeting to be held Wednesday night at the Lyceum theater. The public will be invited to this meeting, which is sponsored jointly with the State Association and the St. Louis County Medical Society by the St. Louis County Public Health Association.

The annual banquet of the association will be held Thursday night at the hotel, with Dr. Haggard and Dr. Abell as speakers. It will be followed by dancing.

Round table luncheons arranged for Monday and Tuesday represent a departure in state meeting programs. The subject for the Monday luncheon will be social hygiene, and Dr. W. A. O'Brien will be the principal speaker and discussion leader.

All of the speakers at the Tuesday morning session will be invited to attend the Tuesday luncheon to answer questions and lead the informal discussion of the morning's program.

The annual meeting of the Women's Auxiliary will be held Thursday morning, to be followed by the annual luncheon at the Northland Country Club. The usual Board meeting will take place Wednesday at the hotel to be followed in the late afternoon by a tea at the Woman's Club.

AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS

Preventive medicine will be the keynote of the 23rd annual meeting of the American Association of Industrial Physicians and Surgeons which will be held concurrently with the Midwest Conference on Occupational Diseases at the Palmer House in Chicago, June 6, 7, 8 and 9, 1938.

Dr. Edward C. Holmblad, 28 E. Jackson Blvd., Chicago, Chairman of the Program Committee, announces the most interesting program in the history of this organization.

Advance programs of the meeting are available to any doctor interested and will be sent without charge to any practicing physician interested in attending this meeting. The sessions will be open to any practicing physician in accordance with the educational program of the Association to spread the propaganda of preventive medicine and absenteeism of employees.

For an advance copy of the program or for information on exhibits, address—Mr. A. G. Park, 540 No. Michigan Avenue, Chicago.

WASHINGTON COUNTY

The Washington County Medical Society met April 12. During dinner two representatives of the American Benefit Association spoke on the Association's hospital insurance policy.

The survey of medical care to be conducted by the American Medical Association in coöperation with county societies throughout the country was explained.

The meeting was then addressed by Dr. Carl Larsen of Saint Paul on the subject of "Sinus Disease" with special emphasis on surgical treatment.

In Memoriam

John T. Gill

1858-1938

DR. JOHN T. GILL of Echo, Minnesota, died suddenly on February 28, 1938, while making a call. He was eighty years of age.

John T. Gill was born February 26, 1858, at Monroeville, Ohio, where he grew to manhood. He attended Western Reserve College at Cleveland, and in 1886 received his medical degree from the New York Medical College.

After practicing in Monroeville for four years, Dr. Gill went to Kansas City, Missouri, where he practiced two years in the Cherry Street Hospital. He then practiced two years in Chicago, moving in 1895, to Echo, Minnesota, where he had practiced for forty-three years. The esteem in which he was held by his many patients and friends in the locality in which he practiced so long was well expressed in local newspapers. He never refused to respond to a call even in the early days when long trips over the prairie in winter necessitated the use of cutter or bob sled.

Dr. Gill was married October 9, 1895, to Blanche McClure at Redwood Falls. He is survived by his widow and seven children. He was a member of the Masonic order and had served on the village council and school board and as health officer.

Clarence Moors Golden

1877-1938

DR. Clarence M. Golden, of Tyler, Minnesota, passed away on March 23, 1938. He had been in poor health for the past two years and confined to his bed since August.

Dr. Golden was born at Marston, Michigan, June 30, 1877. After attending local schools he was a student for two years at the University of Michigan and received his medical degree from the St. Louis College of Medicine in St. Louis, Missouri, in 1906.

On November 6, 1905, Dr. Golden was married to Helen Grant of Bemidji. Her untimely death occurred in 1935. Dr. Golden was a member of the Lenont Hospital Staff in Virginia, Minnesota, for some eight years before removing to Ruthton in 1914. In 1920 he became affiliated with the Tyler Clinic and Hospital, which has been established by Dr. A. L. Vadheim.

Dr. Golden served as county coroner of Lincoln County for four years and had been active in Red Cross work, especially at the time of the World War. He was an able surgeon and conscientious in the care of his patients. He is survived by his son Harold and a sister, Mrs. Ruth Simpson, both of whom helped care for him during his last illness. He is also survived by a half sister, Mrs. D. G. Knapp, and his stepmother, Mrs. O. J. Golden, both of Kalamazoo, Michigan.

MINNESOTA MEDICINE

IN MEMORIAM

Clarence R. Morss

1880-1938

DR. CLARENCE R. MORSS of Zumbrota passed away at the Colonial Hospital, Rochester, Minnesota, on March 23, 1938.

He was born in Ledgedale, Pennsylvania, May 1, 1880, and accompanied his family to Scranton, Pennsylvania; in 1893. He attended school in Lackawanna and Scranton and in 1904 graduated from Lehigh College with a B.A. degree. He received his M.D. degree from the University of Pennsylvania in 1908, having been a member of the H. C. Wood Medical Society during his internship at the Philadelphia Methodist Hospital the following year.

Dr. Morss arrived at Coleraine, Minnesota, in April, 1910, to become attached to the staff of the Coleraine Hospital, a United States Steel Corporation institution. Resigning from this work in 1913, he practiced in Duluth until February, 1914, when he moved to Zumbrota, Minnesota, remaining there until April, 1917, when he returned to Coleraine. In May, 1918, he joined the medical corps of the army and was stationed at Camp Greenleaf and later at Fort Oglethorpe before spending ten months overseas, principally in France. Upon leaving military service in September, 1919, he relocated in Zumbrota, where he has continuously practiced.

Dr. Morss was prominent in social and civic affairs at Zumbrota. He had been president of the Zumbrota Golf Club, president of the Commercial Club and president of the Board of Health. He was a member of the St. Louis County Medical Society, Minnesota State and American Medical Associations. He was also a Knight of Pythias and a member of the Presbyterian church.

Homer Francis Peirson

1867-1938

MARCH 24, 1938, marked the passing of one of Austin's oldest physicians, at least in years of service. Doctor Peirson had practiced in the community of Austin since 1896, when he went there from Minneapolis upon completion of his internship.

Homer Francis Peirson was born September 11, 1867, on a farm near Stewartville, Minnesota, where his parents came from Wisconsin in 1854. In 1874 his parents moved to Grand Meadow and there he attended school. He then spent one year at Carleton College, Northfield, Minnesota. In 1891, he graduated from the University of Minnesota. He took up the study of medicine at the Rush Medical College in Chicago, where he graduated. He then spent one year in intern work at St. Mary's Hospital in Minneapolis.

Doctor Peirson took little part in local politics, but served as coroner for a number of years and as president of the old Mower County Medical Society the year he came to Austin. He was a member of the state and national medical societies for a number of years. He was a member of a number of fraternal

organizations, serving as medical examiner for them.

Doctor Peirson had but two real interests in life—his profession and his family. He leaves a widow and two daughters. He was always kind and considerate in his home, a devoted father, and friendly to all.

Although he had been in failing health the past two years he refused to give up his life's work, his practice of medicine. He went each day to his office and it was there he suffered the cerebral hemorrhage from which he died a few hours later.

Ira M. Roadman

1865-1938

DR. Ira M. Roadman of Minneapolis died in February following an emergency operation performed during a vacation trip to Mexico.

Born in Stahlstown, Pennsylvania, he was educated in Cedar Falls, Iowa, and at Cornell College, Iowa, receiving his medical degree from Minnesota.

For several years Dr. Roadman was chief medical attendant for the Duluth, Missabe and Northern Railway at Duluth. He later practiced at Onamia, Minnesota, and during the World War was stationed at Fort Leavenworth in the Medical Corps. In 1919 he entered the United States medical service for Indians and was stationed at Ponsford, Minnesota. In 1931 he retired and had since lived in Minneapolis.

Dr. Roadman was a thirty-third degree Scottish Rite Mason and a member of the Methodist Church. He is survived by his widow, a son, Howard R., and a daughter, Bernice.

HOSPITAL NOTES

(Continued from Page 348)

the Association numbers 163,000, including dependents, in its membership, being surpassed by only one similar association, that in New York City.

After listening to selections rendered by a quartet of nurses from the Deaconess Hospital of Minneapolis, Mayor Gehan of Saint Paul presented the certificate of approval to the president of the Association and paid tribute to the officers and trustees of the Association.

Mr. E. A. Van Steenwyk, executive secretary of the Association, presented some interesting figures in connection with the Association. Since the beginning of the Association's activities a total of about \$750,000 has been paid out to hospitals for service rendered; about 400 members are now daily provided hospital care with an overhead cost last month of 11.1 per cent; every fifth person one meets on the streets of the Twin Cities is a member or dependent of the organization; 46 per cent of the members have their hospital bills paid entirely by the Association; an additional 44 per cent pay less than \$10.00 for their stay in the hospital, and the remaining 10 per cent pay over \$10.00.

In concluding the program, Dr. W. A. O'Brien talked on the service hospitals supply, and mentioned the high standing of hospitals in Minnesota.

PROCEEDINGS of the MINNESOTA ACADEMY of MEDICINE

Stated Meeting, Thursday, March 3, 1938

President, DR. O. W. YOERG, in the Chair.

PERFORATING HEMORRHAGIC (ENDOMETRIAL) OVARIAN CYSTS.*

CHARLES A. HALLBERG, M.D.

In 1921 Sampson⁷ published his first contribution dealing with a type of ovarian blood cyst heretofore variously designated as tarry, chocolate, perforating and hemorrhagic cyst. The term "ovarian cysts of endometrial origin" was suggested to distinguish this type of cyst from other ovarian hematomas.

As a result of the above and succeeding contributions by Sampson⁸ dealing with this subject, the disorder was quickly accepted as a clinical and pathological entity and is now commonly designated as endometriosis or endometrioma of the ovary.

Endometrium within the ovary was first described by Russel⁹ in 1899, which he believed represented an inclusion of the Müllerian duct. Pick³ in 1905, in a notable study of ovarian hematomata, gave the first description of a typical chocolate cyst, and, furthermore, described the functional as well as morphological resemblance of the epithelial lining of the cyst wall to endometrium.

The following quotation of his paper is from the translation by Graves¹:

"As a result of the glandular development of the germinal epithelium, its invasion of the ovarian substance and the round cell proliferation of the surrounding stroma, there occurs in the ovary a form of adenoma which reflects a perfect likeness to the endometrium of the corpus uteri—adenoma ovarii endometrioides; this tumor is especially likely to be associated with fibroids of the uterus.

"The ovary is in such cases either insignificant (pure adenoma) or cystic (cystadenoma) and may reach the size of a goose egg. The single or multiple cysts are distinguished by a syrupy chocolate colored or more reddish content; and a more or less pigmented mucus-like membrane of the type of endometrium of the corpus uteri. The pigment of the contents and the 'mucosa' is derived from hemorrhages which follow the participation of the endometrial-like tissue in the menstrual and other congestions of the internal genital organs."

The prevalent theories of origin of endometrial cysts of the ovary may be divided into two groups: (1) the serosal theory and (2) the implantation theory.

The serosal theory owes its development mainly to Robert Meyer.² He points out that the pelvic peritoneum has its origin in the coelomic mesothelium. He demonstrated that stimulation or injury of the pelvic peritoneum by means of inflammation may produce, during the processes of healing, a metaplasia of serosal cells enabling them to develop endometrial-like glandular structures.

This theory may be applied to the germinal epithelium on the surface of the ovary. Pick, as noted in the above quotation, ascribed the endometrial structure within the ovary to metaplasia and invasion of the germinal epithelium.

*Inaugural thesis.

Novak⁴ suggests that disturbances in endocrine function may serve as a stimulant to the formation of aberrant endometrium.

Sampson's implantation theory arises from the observation of blood flowing from the fallopian tubes during a pelvic operation performed either immediately following a curettage of the uterus or, more commonly, at the time of menstruation. He proved that blood thus regurgitated through the fallopian tubes carried with it fragments of uterine or tubal mucosa. These fragments of endometrium, falling upon the ovary, possess the ability to invade its surface and, with continued growth, develop into glandular or adenomatous structures. The adenomata thus formed react to menstruation in a manner similar to that of the uterine mucosa. The accumulated and retained menstrual blood results in the formation of blood cysts.

On the surface of the ovary, these hematomata appear as single or multiple minute purple cysts. Deeper penetration into the ovary results in the formation of cysts varying in size, filled with menstrual blood. As the cysts gradually enlarge with each menstrual cycle, rupture eventually occurs, spilling the contents of the cyst into the pelvis. The escape of fragments of aberrant endometrium may result in the formation of new implants upon the various pelvic structures. Dense adhesions are formed between the site of perforation and adjacent pelvic structures.

King⁵ believes that so-called endometrial cysts develop from structures within the ovary. He describes numerous instances of tarry corpus luteum cysts and tarry cysts of the atretic follicle identical in gross and histological structure with endometrial cysts. The origin of the epithelial lining of the cyst wall is not established but he states it arises probably by metaplasia from cells which are present in the ovary.

Pathology.—The diameter of endometrial cysts usually varies from 2 to 6 cm. They may be single or multiple. When multiple cysts exist, they frequently communicate with each other, suggesting the occurrence of rupture of the wall into neighboring cysts.

The outer surface of the cyst is bluish gray in color and usually presents a wrinkled appearance. There are two striking and characteristic features of the appearance of these cysts after their removal, namely the presence of one or more perforations of the cyst wall, with a thick roughened area of ovarian tissue around it, indicating the site of dense adhesions; the second, the exceptionally thick walls of the cyst which stand apart and do not collapse after the contents have escaped.

The lining of the cyst cavity is usually stained a deep brown, from the retained blood. The contents of the cyst resemble thick chocolate syrup.

The diagnostic feature of endometrial cysts is the discovery of an epithelial lining. Sampson describes the epithelium as being low cuboidal or columnar resting on a vascular stroma, sometimes containing gland-like structures resembling uterine glands. The stroma shows evidence of recent or of old hemorrhage.

The extent of the epithelial lining is variable. It may be found only at the site of perforation; it may line the entire cyst or a part of it; or may occasionally be entirely absent.

According to Sampson's investigations, the epithelial lining may be more or less completely cast off in certain phases of its reaction to menstruation. As regeneration of the epithelial lining occurs, it may exist only in limited areas.

Portions of the cyst not lined by epithelium consist of ovarian stroma and usually some areas of luteal membrane.

The routine pathological examination in the hospital laboratory fails to discover epithelial structures in the majority of instances, and as luteal cells are commonly encountered, the pathological diagnosis is usually corpus luteum cyst. It, however, seems probable that if studies were made of the entire lining of the cyst, discovery of adenomatous structures would be materially increased.

Endothelial cysts are infrequent before the age of thirty and rare before the twenty-fifth year. Approximately 10 per cent occur in the second decade. Their number is about 25 per cent greater in the fourth decade than in the third. If pregnancy has occurred, it is commonly limited to a single instance.

Its incidence among single and married women is about equal. A history of a previous pelvic infection is notably infrequent.

The almost universal existence of dense adhesions to neighboring structures makes for a varied and extensive symptomatology. Additional complexities in diagnosis may be provided by associated endometrial implants disturbing the function of the urinary and intestinal tracts.

The leading symptom is pain, in the form of dysmenorrhea of the acquired type. Pelvic pain may be present or absent throughout the menstrual interval, but in any event it is almost certain to be increased a few days prior to and during the menstrual period. It is usually described as an aching in the lower abdomen and frequently as backache in the sacral region.

Some form of disturbance of the menstrual flow is the rule, usually causing prolonged or increased flow, or both. This group of symptoms are quite identical with those met with in a case of subacute or chronic pelvic infection.

The information obtained by pelvic examination is frequently misleading. The usual characteristic features of an ovarian cyst, namely, a rounded elastic tumor, movable and readily identified as being separate from the uterus, are physical signs entirely foreign to a typical adherent hemorrhagic cyst. Instead, one finds a mass of indefinite outline, almost invariably with more or less fixation, in most instances intimately attached to the uterus, often nodular in the lowermost portions and usually sensitive to pressure. They may particularly re-

semble uterine fibroids occurring near or in the cervix.

Not infrequently, a relatively small cyst with numerous perforations and extensive attachments to the uterus, broad ligament, small intestine, sigmoid and omentum will produce a mass filling one-half of the pelvis.

Surgical procedures in this disorder are necessarily governed by the age of the patient, the extent of involvement of the ovaries, the condition of the uterus, and the existence of endometrial implants in other organs. If the disorder is localized in one ovary, and implants elsewhere are absent, removal of the involved ovary has usually proved to be sufficient. With extensive bilateral involvement, removal of both ovaries, with or without hysterectomy, generally is indicated. In young women, excision of the cysts may be tried, though reports indicate that recurrence is likely.

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MEDIAN NERVE SUTURE, NEUROLYSIS OF ULNAR NERVE, PLASTIC REPAIR AND RESECTION OF ULNA FOR DEFORMITY OF HAND

ARTHUR F. BRATRUD, M.D.

This patient, Miss S. S., at present twenty-two years of age, was first seen in August, 1926. She gave the following history at that time. While living in Madagascar she accidentally fell out of a tree, landing on the right hand with the hand partially adducted and the hand flexed. This occurred about January 5, 1925. She received a compound fracture of the wrist, with one of the bones sticking out through the broken skin. She was attended by a physician on the island, who applied a cast after reduction of the fracture. An infection resulted and the cast was removed. This was followed by extension around the wrist by means of a bandage. This bandage cut into the skin and an infection resulted in the sides of the wrist as well as lower end of the forearm and wrist. She was up and out of bed by the first of February, 1925. The wounds were not entirely healed until August, 1925. Later she received massage treatments, during the time that she was in Madagascar. She stated that she could bend the hand at the wrist slightly, but had no motion in the fingers in any direction. She complained at that time that she had no feeling in the radial side of the palm of the hand or on the flexor surface of the thumb, first and second fingers, and very slight sensation on the ulnar side of the palm of the hand, and flexor side of the third and fourth fingers, as well as the corresponding area on the back of the hand. She also stated there was complete numbness on

the back of the thumb, first and second fingers, and that she could turn the hand but very little.

When examined there was a dense, thick, heavy scar, about two and one-half inches in length, covering the entire flexor surface of the wrist and the lower part of the forearm. This seemed to be fixed to the bone. Pronation and supination at the wrist was very nearly nil. Fingers were held slightly separated, with no semblance of adduction, abduction, extension, or flexion. The hand was held in a position of abduction with the ulna pressing out into the skin and shoving the hand into that position. There was present very slight flexion and extension and slight abduction and adduction at the wrist.

This case presented a very poor outlook as far as ultimate good result was concerned. However, on August 23, 1926, she was operated upon at Fairview Hospital, at which time the following findings were present. There was complete severance of the median nerve at the wrist and a large amount of scar tissue around the ulnar nerve at this location. There was a mass of scar tissue between the profundus and sublimis digitorum muscles, and the ends of the tendons at the wrist. It appeared as though there were no tendons passing through this scar tissue. The mass of scar tissue, anterior to the radius, ulna and pronator quadratus muscle was completely dissected away. The median nerve was resected to a point when the fasciculi appeared normal. On account of the amount of the destruction of the median nerve it was extremely difficult to obtain apposition of the severed ends. A neurolysis of the ulnar nerve was performed. The hand had to be put up in an extreme degree of flexion in order to secure apposition of the severed ends of the median nerve, even after loosening this up into the middle third of the forearm. A pedicle fat flap from the chest wall was then attached, splitting the fat fascia and replacing a layer between the scar tissue and the bones of the forearm, pronator quadratus and carpal bones. This left a good layer of fat anterior and posterior to the nerve and scar tissue. The pedicle flap wound was dressed with a parowax dressing as follows: Open sterile gauze is dipped in warm melted sterile parowax, and applied at once, before the parowax hardens to the skin and raw surfaces. This does not have to be removed before separation of the flap, and allows painless dressing. On September 7th, a separation of the pedicle flap from the chest to the right forearm was performed. A plastic closure of the raw areas of the chest was performed at this time. The flap was in very good condition. On January 5, 1927, a resection of the lower end of the ulna above the epiphysis was performed about one inch above the lower end of the bone, so as to allow the wrist to assume a normal position. In July, 1927, there was beginning return of sensation in the median nerve distribution of the hand.

This girl was advised to try to use the hand as much as possible, and to keep up massage as much as possible. Several years later a letter was received from her, stating that her hand was improving so much that she could bend and separate the fingers, and was beginning to play the piano. She was not seen again until December, 1937, at which time the following findings were present. There had been complete loss of growth of the radius on account of the destruction of the epiphysis which had resulted at the time of the original injury. This was present when first seen in 1926. The ulna had continued growth again after resection and was protruding downward so as to throw the wrist into the position of marked abduction. There was very slight pronation and supination present at the wrist. Flexion and extension at the wrist was present to a moderate degree. Abduction and adduction of the fingers was present and the fingers could be flexed, but not sufficient to close the hand completely. Intrinsic muscular action of the hand had returned completely. There was

complete return of sensation in both the median and ulnar nerve distribution. The pedicle flap which had been separated from the chest was extremely thick and heavy. When an attempt was made to move the fingers it appeared as though there was a large amount of scar tissue holding the tendons at about the level of the annular ligament.

On December 12 at New Asbury Hospital, the pedicle flap was loosened and a large amount of fat, with some skin, was removed. At that time the area which had practically nothing but scar tissue between the muscles and tendons, had a group of tendons completely down through the fatty tissues. The fat tissue posterior to the scar tissue and tendons was well preserved. There was a mass of scar tissue at the lower end of the pedicle flap. Adhesions were freed and a closure of the wound was performed. Incision was made laterally to the ulna and the distal end of the ulna resected. Since this time she has been making very nice improvement again. There was impairment of function for a few weeks after the last operation. Pronation and supination has increased since December 12. She can now flex the fingers so that the fingers almost touch the palm of the hand. Abduction and adduction of the fingers is not quite as good as previous to the last operation, but is improving constantly from week to week, so that ultimately it will probably be very nearly normal. On account of the contraction of the flexor tendons the fingers can be completely extended only when the hand is flexed. It is also noted that the hand is very much smaller than the normal hand.

The striking feature about this case was the fact that nerve suture was performed one year and eight months after the original injury. The opinion prevails that nerve suture after eighteen months gives practically no results. However, here is a case which shows practically complete restoration of function, with suture being performed one year and eight months after the original injury or severance. Whether the destroyed epiphysis of the radius in this case was caused by infection or the injury, is difficult to say. However, it impaired the growth of the bone in the radius. The other striking feature is the fact that tendons which were not present at the time of the first operation in August, 1926, have grown or regenerated down through the fat so that there was a mass of tendons extending down through the fatty tissues.

This girl is normally a right handed individual. Since her injury she has educated her left hand so that now she is practically a left handed individual.

Discussion

DR. KENNETH BULKLEY: It was with considerable pleasure that I had the opportunity of seeing this patient in consultation with Dr. Bratrud a short time before he operated upon her for the second time, and also to have again had the opportunity of examining her a few days ago. Dr. Bratrud is to be congratulated on obtaining so useful a hand for a patient who originally seemed to have a hand hopelessly crippled as far as any real use of it was concerned. This case should not only serve as a lesson in optimism to us, but can also be used as a text for a few remarks on four different problems which it illustrates.

The first relates to the viability of transplanted fat. There has long been a controversy, more or less, as to whether transplanted fat remains as such or gradually undergoes fibrosis. I believe this case illustrates the fact that it does maintain its identity and viability. The

first full thickness transplant which Dr. Bratrud made and the remains of which you now see was infinitely thicker than it now is, since Dr. Bratrud at the second sitting dressed it down. The pad was characteristic, soft and pliable, and Dr. Bratrud informs me that at operation there was very little, if any, signs of fibrosis in it.

The second problem relates to tendon regrowth or which might possibly better be termed tendon refunction. Dr. Bratrud informs me that when he first operated upon this girl some 11 years ago at the point where the tendons emerged from the fleshy bellies of the flexor muscles they disappeared into a mass of what appeared to be fibrous scar tissue, and you will remember that he made no attempt to separate these, if they existed, one from the other, but simply undermined this mass of scar tissue, interposing flat beneath it and also superficial to it beneath his skin flap; and yet you have seen demonstrated tonight how a hand, practically useless in the form of a "claw," has re-educated or re-differentiated or possibly, to a certain extent, regrown its tendons so that at least to a very serviceable extent they now function.

The third point of interest in this case to me seems to be the lack of growth of the radial epiphysis, which is probably more common in fractures of the ends of the long bones in children than is generally recognized. Compere,* in a recent report from Chicago, has investigated the growth arrest in long bones after fractures including the epiphysis. About thirty-five per cent of all fractures that had been treated in his Clinic occurred in children fourteen years or younger and fourteen per cent of these fractures in children involved the growth epiphysis; and of these involved cases that were cared for and followed over a period of six months with x-rays, ninety-five per cent of them showed growth disturbances. The method used by Dr. Bratrud in each operative sitting for the correction of this radial deviation by resection of a portion of the ulna is the classical procedure commonly used.

To me the most astounding result obtained in this case was the regeneration of both the median and ulna nerves. You will remember that this girl suffered her primary injury south of the southernmost tip of Africa and was not operated upon here in Minneapolis by Dr. Bratrud until approximately twenty months later. If I understand the situation correctly the median nerve was found completely divided and an end-to-end anastomosis was necessary, with marked flexion of the wrist thereafter in order to bridge the defect which so commonly occurs in these nerve divisions; and yet nine months later this girl was already beginning to show signs of regeneration and today she has complete regeneration of her median nerve. This is an almost unheard of result as far as I know for nerve regeneration where the repair has been made later than the sixth or at most the ninth month following severance. The regeneration of the ulna nerve is possibly easier to understand inasmuch as I believe it was not completely severed but merely thoroughly embedded in scar tissue, requiring only a neurolysis.

In view of the fact that no one of us as individuals see any large number of nerve trunk injuries, possibly it would be of value to refresh our memories as to what goes on in the regeneration of a nerve trunk, and for that purpose I am going to close my discussion by quoting Campbell† on the subject:

"After complete or partial severance the ruptured nerve fibres separate; the distal segment loses its function and undergoes degeneration. The injury produces an effusion of blood, and migration of leukocytes takes place into and about the end of the proximal segment and throughout the entire distal segment. The axis-cyl-

inders perish, the myelin sheath is absorbed and the cells along the inner surface of the neurilemma cease to proliferate. The sheath shrinks and becomes empty except for scattered masses of nuclei and protoplasm. The degeneration occurs rapidly, beginning within twenty-four hours after the injury, and is complete in a few days. The leukocytes are replaced by connective tissue cells which absorb the fatty myelin and the axis-cylinders, and the degenerated nerve trunk becomes hard, fibrous and cirrhused. In the proximal end of the divided nerve, an end-bulb is formed by curling up of the prolonged nerve fibres and fibrous tissue. While degeneration occurs in a few days, regeneration requires months. The exact method of regeneration is uncertain. Partial regeneration undoubtedly occurs in the distal segment, independently of the proximal, although complete regeneration is not possible unless the two segments are in apposition. The generally accepted theory is that the nerve is regenerated by the prolongation of the existing nerve fibrils in the proximal segment. The fiber, which is at first composed of myelin, pierces the granulation tissue between the nerve ends and enters into the empty sheath of the distal segment. It grows slowly along the scaffold of the degenerated trunk and function is re-established only when the new axis-cylinders have permeated the nerve."

DR. S. T. MAXEINER: I realize that most reports of late nerve suture are not encouraging and nerve suture of long standing is often condemned. However, I would call your attention to the Clinic given by Dr. Kanavel before the American College of Surgeons in Chicago, at which time he reported a nerve suture in the case of a Seattle surgeon five years after the original injury. Regeneration was extremely slow but was progressive over the next five-year period and became so complete that the doctor is able to do his own surgery. This would suggest that nerve suture performed after the lapse of five years is not entirely hopeless.

DR. G. R. DUNN: I certainly think that Dr. Bratrud is to be congratulated on this case. This case presented most unusual difficulties, the establishing of full thickness skin graft, freeing of the tendons, suturing of the nerves and correcting the growth disturbance. Each and every one of these procedures is difficult and that the four procedures should have given such an excellent functional result is quite remarkable. I think it is one of the best cases of this sort I have had the pleasure of seeing.

PRESENTATION OF A CASE WITH A LARGE CAVITY IN A POSTOPERATIVE LUNG ABSCESS WITH MULTIPLE LARGE BRONCHIAL FISTULÆ

W. A. HANSON, M.D.

Mr. E. N., thirty-seven years of age, married, was seen by us in February, 1934, with the following history. His past history and illnesses were irrelevant. He stated that while in the Orient at Java, on October 7, 1929, he was acutely ill and was operated upon for acute appendicitis. He was discharged from the hospital at the end of ten days feeling well. Four or five days later he began to have pains in the right chest followed by a persistent unproductive cough. The symptoms persisted more or less until January, 1930, when his cough became productive with a large amount of sputum, and "probably associated with a fever." At this time he was informed that he had "pleurisy." His weight had decreased from 145 to 115 pounds. During his travels from Hongkong, Shanghai, and Japan his cough became more persistent and at this time he raised considerable sputum

*J.A.M.A., 105:2140-2146, Dec. 28, 1935.

†Campbell: A Textbook of Orthopedic Surgery, 1930.

and "decayed lung tissue." His condition was diagnosed as tuberculosis. Radiographs of his chest were interpreted as bronchiectasis. Following this he began to raise blood and pus in his sputum. At Manila his right chest was aspirated, obtaining "pus and water," and he was informed that he had a lung abscess.

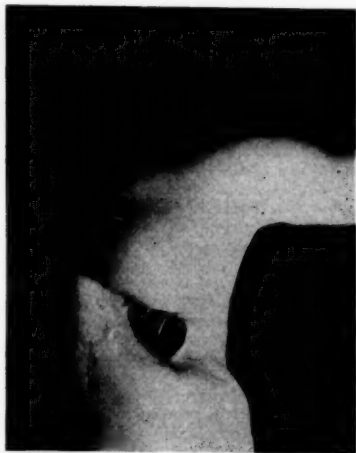


Fig. 1.

He returned to the United States in August, 1930. He raised a pint of sputum in each twenty-four hours, consisting of blood, pus, and mucus, which had a foul odor. Following bronchoscopy a diagnosis of bronchiectasis was made. He had a continuation of his symptoms until December, 1930, when he had a rather profuse hemorrhage from the lung. Following this he had aspirations of the chest and a series of posterior rib resections with beneficial results. Subsequently he developed a large cavity with bronchial fistulae, which we wish to demonstrate this evening.

At this present time, his physical examination shows a well developed male who weighs 142 pounds and is 5 feet 6 inches tall. His blood pressure registers 110 systolic and 70 diastolic in mm. of mercury. His pulse is 72 beats per minute and his temperature is 98.6°. The examination of the head, eyes, ears, nose and throat reveals no abnormalities. The fingers reveal a moderate clubbing, characteristic of chronic lung disease. The right chest in the subscapular area shows a large cavity about the size of two navel oranges with many fibrous strands and bronchial fistulae. One fistula communicates with the main hilus bronchus. The wound shows no evidence of infection. This is packed daily. On removal of the packing he is very dyspneic and is unable to talk above a whisper. The left chest is free from abnormalities. Examination of the urine is negative. His blood shows a hemoglobin of 78 per cent (Dare) and 4,100,000 red blood cells per cubic millimeter of blood.

Radiographs taken of the chest show no abnormality in the left lung field. The right chest shows resections with partial regeneration of the fifth, sixth, seventh, eighth and ninth ribs. There is a partial collapse of the lower lobes and thickened basal pleura.

Comment.—This case is of interest first because of the past and present disease and second from the standpoint of what method would be most efficacious in closing the large cavity and large fistulae.

According to Dr. Carl Hedblom's collected series of

686 cases of lung abscess, 71 per cent occur in males and 29 per cent in females, except in those occurring after tonsillectomy, where the incidence was 43.9 per cent in males and 56.1 per cent in females.

The recognized causes of lung abscess are:

1. Aspiration through the bronchial tree.
2. Pneumonia.
3. Embolism.
4. Extension from other foci such as subphrenic, liver, perirenal, etc.
5. Trauma as by a blunt blow on the chest wall, with the onset of the disease varying from one to five weeks. Stab wounds and penetrating injuries may manifest such complications months or years after the original injury.
6. Specific infections such as actinomycosis ameba histolytic, etc. Tuberculosis cavities are not included.

A further consideration of the symptoms, pathology and findings will not be reviewed, as they are ably discussed in the textbooks, other than to state that this patient probably developed his complication from an embolism, although ascending infection cannot be disregarded.

Regarding the treatment of lung abscess, several procedures are available. An ingenious, rather simple method has been devised by Dr. O. H. Wangenstein and reported in the *Journal of Thoracic Surgery* for December, 1937. Dr. Wangenstein employs needling, graduated trocars, coagulation and drainage. Dr. E. A. Graham's method with a cautery is recommended in certain cases with good results. These depend on fibrosis of the visceral and parietal pleura with drainage.

The method to accomplish the closure of the large cavity and multiple fistulae under consideration in this case may be: (1) obliteration of the strands of adhesions with cautery and conversion of the cavities into one pocket; or (2) further thoracoplasty for obliteration of the cavity employing muscle implants to close the fistulae.

Discussion

DR. T. J. KINSELLA: I was very interested in seeing this patient of Dr. Hanson's. He certainly presents a condition which we do not see frequently. He now has multiple bronchial fistulae which are, in reality, the residue of bronchiectatic abscesses with their bronchial openings. This lower lobe is nothing more or less than a honeycomb and this type of condition, once it occurs, is permanent. It will not clear by itself and it will not clear with bronchoscopic drainage. A single drainage tube inserted into a lung of this sort does not drain the abscesses because they are multilocular and not one single pocket. The only way you can handle this sort of condition is either to resect the lobe involved or to do a Graham cautery for external drainage, creating multiple bronchial openings to drain the pus externally rather than to let the patient cough it up. In the presence of an empyema, primary resection of the lower lobe containing the bronchiectatic abscesses would be inadvisable because it would undoubtedly result in contamination of the mediastinum and probable loss of the patient.

Drainage of these abscesses is necessary and the Graham cautery in the presence of an infected pleural cavity or an empyema offers one method of obtaining drainage and relieving the patient of his symptoms without the risk of dissemination of the infection. It does leave a rather nasty condition in the chest, in that you now have multiple pockets, communicating with your operative wound, and all of the pus which originally drained up through the bronchus now comes out or through the wound. After a period of time, however, the infection subsides, but the pockets still remain. The secretion diminishes, leaving an epithelialized tract or series of pockets which produce very little discharge. If you now surgically close up this wound, while there are still abscess cavities present, even though they contain no pus, you will probably induce a recurrence of the trouble. This man now has multiple pockets which are relatively clean and show little or no pus ordinarily, but if they were closed up by an external plastic collapse procedure he would undoubtedly develop cough and expectoration and have further difficulty.

This man, as he walks around, is not short of breath and can work, if he carries a tight pack in his wound. If he does not have a tight pack in his wound he can scarcely speak above a whisper for most of his air comes out through the external openings. He then loses his wind and is not able to work. From a surgical standpoint, there are two or three things which might be attempted. One is to convert all of these abscesses into one single pocket and then do an external collapse procedure to bring the walls into contact to allow healing. A muscle transplant might be turned into the pocket to attempt to close the bronchial fistula, but this is rather a difficult thing to do in this instance. Much of the muscle on the back of his chest has been destroyed in the previous surgical procedures, leaving very little for a transplant into the fistula. Smaller fistulae may be closed by cauterization with silver nitrate, leaving a clean wound which will close by external plastic procedure. If the fistulae cannot be closed, and many of the large ones do not close readily, then you are confronted by a very complicated proposition which may demand all your ingenuity and maybe more than that to get rid of it. In some instances it may prove wiser to let well enough alone and let the patient continue to work with his chest wall defect.

DR. OWEN WANGENSTEEN: There are two matters of great interest in the case presented by Dr. Hanson: one is the question of the etiology of the suppurative process in the lung which eventuated in the condition which Dr. Hanson has shown us; the other revolves about the more important consideration of treatment.

Both Drs. Hanson and Kinsella indicated that they believed the process to have had its origin through an embolic source—a thesis for which a plausible defense may be prepared. Yet, I am inclined to believe that this was an ascending rather than a descending infection. The patient, as Dr. Hanson stated, had an appendectomy for suppurative appendicitis; he left the hospital ten days later while he was still ill; he continued ill and lost weight from 145 to 115 pounds. My reaction would be that a subdiaphragmatic abscess developed, which subsequently penetrated the diaphragm and lay outside the lung for a long time as an occult empyema. Only after a lapse of about fifteen months did the abscess rupture into the lung, signalled by the spitting up of large quantities of sputum. Subsequently, the pulmonary abscess ruptured into the pleural cavity at a site where there was a free pleural space, for, as Dr. Hanson said, the patient became suddenly much worse and when the pleural cavity was aspirated, considerable exudate was obtained. There having been no evidence of pulmonary

suppuration earlier in life we can disregard primary bronchiectasis as a consideration—other than as an occurrence secondary to long continued pulmonary suppuration.

This interpretation of the story which Dr. Hanson related may appear a bit unusual. At this remote date, one can only speculate as to the probable sequence of events. But mindful of the long period of time intervening between the initial suppurative process in the appendix and the first suggestion of pulmonary suppuration, I do believe the facts as stated lend considerable weight to the ascending view which I have taken of the matter.

At the present moment, I have at the University Hospital a young woman who was operated upon for suppurative appendicitis three years ago. A subdiaphragmatic abscess developed and was drained. In the intervening years, she had continued to complain of pain near the spine at the level of the tenth to twelfth dorsal segments. A sinus has opened intermittently; it has been enlarged and explored but nothing has been found. On opening the tract widely, recently, I uncovered an occult empyema beneath the tenth and eleventh ribs. It had not yet ruptured through the lung to establish communication with a bronchus. More commonly, of course, the development of a pulmonary abscess follows closely upon the formation of the subdiaphragmatic abscess. Most of you, I am certain, are familiar, however, with the occurrence which I have described.

Drs. Hanson and Kinsella have considered the therapeutic agencies which one might invoke to close the bronchial fistulae which the patient now has. In the light of the satisfactory condition of the patient and his relative freedom from discharge from the fistulae, I would agree that an attempt should be made to close them. As Dr. Kinsella has pointed out there has been already considerable loss of available muscle tissue immediately adjacent to the fistulous openings. Whereas, implantation of a pedicled slip of muscle into a bronchial fistula or suturing a flap of muscle over the stomata is a very useful procedure and one to which I am quite partial (*Journal of Thoracic Surgery*, 1935:5:27), I am inclined to believe that it would be difficult to make such a plan work here. Even though a suitable pedicled muscle flap might be mobilized to fill in the defect, it would be even more difficult to cover the defect and transplant muscle with skin satisfactorily—a very important consideration in the closure of these numerous and large bronchial stomata. The best plan of procedure, I believe, is the procedure of Lebsche (*Deutsch Ztschr. f. Chir.* 189, 279, 1925).

While Professor Sauerbruch was still at Munich, his assistant, Lebsche, described a very useful technic for dealing with numerous bronchial stomata, which condition he described as "Gitterlunge" or gridiron lung. The margins of the exposed lung are mobilized by freeing it from the adjacent skin and other structures. The margins of the mobilized lung are then sutured together, burying the stomata. It is wise, I believe, to insert a temporary drain (*Surgery*, 2:859, (Dec.) 1937, footnote) led off through sufficient thickness of the chest wall, such that a persistent fistula is not likely to form. The skin is then closed securely over the trough of inverted lung tissue.

In order to secure adequate relaxation of the structures of the chest wall to permit satisfactory skin closure over the plastic on the lung, it would be well, I believe, to perform here a preliminary resection of the third, fourth and fifth ribs anteriorly two or three weeks before. It is my impression that the Lebsche procedure for "Gitterlunge" would offer the most satisfactory solution in closing this unusual defect.

INTERNAL FIXATION IN INTRACAPSULAR FRACTURES OF THE NECK OF THE FEMUR

WILLARD D. WHITE, M.D.

Summary

The general problem of treatment of intracapsular fractures of the neck of the femur was discussed. Statistics were given on the mortality, which probably averaged about twenty per cent in patients over fifty years of age who were treated by the old Whitman method or other non-operative means. The mortality increased in direct proportion to the age. As to percentage of unions in the so-called conservative or non-operative treatment represented by the Whitman or Maxwell-Ruth methods, this was not over fifty per cent. In many series the percentage was less.

There have now been enough cases operated upon by internal fixation to give some idea of its success. The method is still comparatively new and it is difficult to establish accurate statistics but there is no question about the fact that the mortality has been decreased and the percentage of unions very markedly increased. There are further advantages in the economic saving and the increased comfort to the patient.

Lantern slides were shown to illustrate pre-operative and post-operative results and patients were presented, all of whom had been operated upon at least a year ago or more. It was demonstrated how these patients could walk, move their joints, et cetera. Some of the hazards or risks were discussed.

Twenty-four cases in which the author performed an operation were discussed. In the first eleven a reduction was accomplished, position checked with antero-posterior and lateral films, a Kirschner wire was inserted and a canulated short flange nail was inserted over the wire and driven into place. In one of these cases the wire bent, in another the wire broke and was driven in through the acetabulum into the pelvis and had to be removed from within the pelvis. Following this, twelve patients were operated upon and the joint opened, the fracture reduced under direct vision and the nail also driven in under direct vision. In the last case the nail was driven in directly through a lateral incision over the trochanter without the preliminary introduction of a wire. The position of the nail was perfect.

Many of the cases are too recent to warrant a report on final results but it was felt that the operative treatment of intracapsular fractures of the neck of the femur with internal fixation offered by far the best means we have to treat this lesion. In the main, a short flange nail of the Smith-Peterson type was used. It is admitted that other types of internal fixation would probably accomplish the same results. In two cases Austin Moore pins were used and were very satisfactory.

Discussion

DR. E. A. REGNIER: Dr. White has covered the field of internal fixation of fractures of the neck of the femur most thoroughly and I assure you he is not the

only one who has made a mistake of judgment and of technic. One must appreciate that internal fixation does not assure a union but rather it insures union. Obviously, there are many methods by which this may be done. I believe, in the light of my short experience, that even though the end-results by internal fixation were no better than those from previous methods, I should still choose the former method because of the absolute relief from pain and the financial saving it affords the patient. When one recalls that these patients were formerly hospitalized twelve to sixteen weeks and in the best hands only 50 per cent of those who survived treatment had satisfactory results, an improved method of treatment is most welcome.

Dr. White mentioned the various methods that he had used in treating these fractures. I believe that the choice of method is optional. It has been my practice to do a closed reduction and subsequently to make a short incision laterally below the trochanter so as to drive the nail over the previously inserted Kirschner wire. I have always attempted to place the nail in a valgus position because this permits less strain on the line of fracture. I believe that the Austin Moore pins, flanged screws and Morrison pin will all maintain fixation but I do not believe that they are compatible with any degree of early unprotected walking. At the General Hospital our patients could not afford walking calipers, therefore we permitted them to walk with crutches two weeks after inserting Smith-Peterson nails. These people were permitted to go home any time after the third week and we soon learned that many of them discarded their crutches soon after leaving the hospital and walked on the nailed hip long before union could take place. I recently had an opportunity of seeing a follow-up x-ray of a man whose hip I nailed one year ago and who has been walking without protection ever since. I will show his film and I think you will agree that he has a perfect union in excellent position. I also had the privilege of nailing the hip in an eighty-six-year-old woman and she was permitted to walk without protection the week following her operation. She has now walked for seven months without any mishaps and is perfectly comfortable. However, I do not advocate unprotected walking short of four to six months. I believe it is perfectly safe to put a properly fitted walking caliper on these people as soon as their wounds are healed. I have done this on over thirty cases and have had no occasion to regret it. The youngest patient that I treated was thirty-eight years of age and the oldest eighty-six. There has been no mortality and up to date only one case has proven a failure. In this individual the head of the femur partly atrophied and rotated off the end of the nail, necessitating a reconstruction operation.

Internal fixation should maintain accurate anatomical reduction and relieve all pain. The relief of pain has been so immediate and so gratifying that it has been my practice to treat these immediately, as soon as the immediate shock of fracture has been relieved, usually a matter of twelve to twenty-four hours. Nothing can be gained by postponing operation. Many old people

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fail rapidly when confined to bed with Buck's extension and morphine to control their pain while awaiting operation. I believe that the small risk and minimal trauma from the operation more than offset the risk of postponement. They are less apt to develop pneumonia and have much more freedom and comfort after operation than before. I believe that this procedure will soon be recognized as a routine and practically an emergency operation. In other words, unless a patient is moribund or has some complicating disease such as severe diabetes, I can see no reason for postponing the insertion of a nail in a recent fracture. (Films were shown.)

DR. V. HART: There are a number of remarks I would like to make but the hour is late so I will just close by telling Dr. White that I have appreciated his instructive paper and that I heartily support his thesis.

DR. E. T. EVANS: I won't say anything about the methods of treatment, et cetera, because I think that in-

ternal fixation of the neck of the femur is here to stay. I think, however, that we have much to learn in cases such as this. In spite of the fact that Dr. White said he hesitated to give a report at such an early date this is probably worth much more than a series of cases with beautiful results, for it is by our mistakes that we are to learn. Dr. Cole and I have now done something over forty hip operations in the last year by the open method, not Watson Jones approach but Kocher's anterior fascial splitting approach, and with the exception of two or three cases we feel we have learned something on every hip we have done. We are becoming more and more convinced that in our open reductions we are obviating some of the difficulties we have seen tonight and that is said with the experience of two or three years of closed reductions in back of us. It doesn't mean that we won't switch back to the closed reduction because we are open to conviction that with some improvements in technic the closed reduction may offer the same results.

HARVEY NELSON, *Secretary.*

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

WORKBOOK IN ELEMENTARY DIAGNOSIS for Teaching Clinical History Recording and Physical Diagnosis. Logan Clendening, Professor of Clinical Medicine, University of Kansas. 167 pages. Illus. Price, cloth, \$1.50. St. Louis: C. V. Mosby Co., 1938.

MEN PAST FORTY. A. F. Niemoeller, A.B., M.A., B.S. Author of American Encyclopedia of Sex, etc. Foreword by Winfield Scott Pugh, B.S., M.D. 154 pages. Price, cloth, \$2.00. New York: Harvest House, 1938.

MANAGEMENT OF THE SICK INFANT AND CHILD. Fifth Edition. Langley Porter, B.S., M.D., M.R.C.S. (Eng.), L.R.C.P. (Lond.), Dean, University of California Medical School and Professor of Medicine, etc., and William E. Carter, M.D., Director University of California Hospital Out-Patient Department, etc. 875 pages. Illus. Price, cloth, \$10.00. St. Louis: C. V. Mosby Co., 1938.

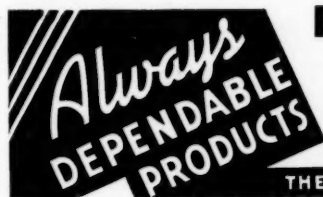
A BIOLOGICAL APPROACH TO THE PROBLEM OF ABNORMAL BEHAVIOR. Milton Harrington, M.D., Psychiatrist, Institution for Male Defective Delinquents, Napanoch, N. Y. Formerly Consultant in Mental Hygiene, Dartmouth College. 459 pages. Cloth. Lancaster, Pa.: Science Press Printing Co., 1938.

PNEUMONIA AND SERUM THERAPY. Revised Edition. Frederick T. Lord, M.D., Clinical Professor of Medicine, Emeritus, Harvard Medical School; Member Board of Consultants Massachusetts General Hospital, etc., and Roderick Heffron, M.D., Field Director Pneumonia Study and Service, Massachusetts Department of Health. 148 pages. Price, cloth, \$1.00. New York: The Commonwealth Fund, 1938.

THE 1937 YEARBOOK OF GENERAL MEDICINE. Chicago: Yearbook Publishers, 1937. \$3.00.

The 1937 volume of the Yearbook of General Medicine is, as usual, an excellent piece of work. Most of the important developments in the field of internal medicine that have been brought forward in the past year have been reviewed. Of special interest to our own readers is the fact that among those authors mentioned we find the names of Drs. Lufkin, Mariette, Myers, Shapiro, Wangenstein, Cecil Watson and Ziskin.

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Johnson, D. W.....Fairmont
Johnson, H. P.....Fairmont
Krause, C. W.....Fairmont
Luedtke, G. H.....Fairmont
Marken, M. H.....Fairmont

McGroarity, J. J.....Easton
Miller, H. A.....Fairmont
Mills, J. L.....Winnepago
Raymond, J. H.....Triumph
Rowe, W. H.....Fairmont
Russ, H. H.....Blue Earth
Sommer, A. W.....Elmore
Sybilrud, H. W.....Bricelyn
Thayer, E. A.....Truman
Vaughan, V. M.....Truman
Virnig, M. P.....Wells
Wilson, C. E.....Blue Earth
Youngman, R. A.....Fairmont
Zemke, E. E.....Fairmont

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle and Yellow Medicine Counties
Regular meetings, every second Thursday in Fall and Spring
Annual meeting, March
Number of Members: 23

President
Johnson, C. M.....Dawson

Secretary
Westby, Nels.....Madison

Bacon, R. S.....Montevideo
Bergh, L. N.....Montevideo
Boody, G. J., Jr.....Dawson

Burns, F. M.....Milan
Burns, M. A.....Milan
Cress, E. E.....Boyd
Foshager, H. T.....Clara City
Hauge, M. L.....Clarkfield
Hauge, M. M.....Clarkfield
Herbert, W. L.....Granite Falls
Holmberg, L. J.....Canby
Johnson, C. M.....Dawson
Jordan, L. S.....Granite Falls

Kath, R. H.....Wood Lake
Lee, W. N.....Madison
Lima, Ludvig.....Montevideo
Nelson, M. S.....Granite Falls
Pertl, A. L.....Canby
Roust, H. A.....Montevideo
Smith, L. G.....Montevideo
Tangen, G. M.....Canby
Westby, Magnus.....Madison
Westby, Nels.....Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Regular meetings, three annually
Annual meeting, December
Number of Members: 24

President
Ingebrigtsen, E. K.....Moorhead

Secretary
Flancher, L. H.....Lake Park

Aborn, W. H.....Hawley
Bergheim, M. C.....Hawley
Bottolfson, B. T.....Moorhead
Carman, J. E.....Detroit Lakes

Duncan, J. W.....Moorhead
Ellingson, A. R.....Detroit Lakes
Flancher, L. H.....Lake Park
Gosslee, G. L.....Moorhead
Gunderson, R. M.....Lake Park
Hagen, O. J.....Moorhead
Haight, G. G.....Audubon
Humphrey, E. W.....Moorhead
Ingebrigtsen, E. K.....Moorhead
Larsen, O. O.....Detroit Lakes

Larson, Arnold.....Detroit Lakes
Moberg, C. W.....Lake Park
Rice, H. G.....Moorhead
Rutledge, L. H.....Detroit Lakes
Seitz, S. B.....Barnesville
Simison, Carl.....Barnesville
Simison, C. W.....Hawley
Stafne, W. A.....Moorhead
Thysell, F. A.....Moorhead
Thysell, V. D.....Hawley

DAKOTA COUNTY MEDICAL SOCIETY

Regular meetings on call
Annual meeting December
Number of members: (Not yet reported)

President
Peck, L. D.....Hastings

Secretary
Burns, L. S.....South St. Paul

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties

Regular meetings, three yearly

Annual meeting, November

Number of Members: 33

President

Schleselman, George.....Anoka

Secretary

Ness, C. M.....Cambridge

Arends, A. L.....Sandstone
Blomberg, W. R.....Princeton
Blumenthal, J. S.....Columbia Heights
Bossert, C. S.....Mora

Brink, D. M.....Isle
Brownstone, Manuel.....Sandstone
Callahan, F. F.....Pokegama
Clothier, E. F.....Elk River
Cooney, H. C.....Princeton
Dedolph, T. H.....Braham
Dredge, H. P.....Sandstone
Halladay, G. J.....Rush City
Halpin, J. E.....Rush City
Hedenstrom, L. H.....Cambridge
Holmes, A. E.....Rush City
Kelsey, C. G.....Hinckley
Kemp, M. W.....Anoka
McBroom, D. E.....Cambridge
Ness, C. M.....Cambridge

Nordman, W. F.....Mora
Norrgard, H. T.....Milaca
Nygren, W. T.....Braham
Peterson, P. C.....Braham
Peterson, A. A.....Mora
Richey, G. L.....Cambridge
Roehlke, A. B.....Elk River
Schleselman, George.....Anoka
Spurzem, R. J.....Anoka
Stephan, E. L.....Hinckley
Stratte, A. K.....Pine City
Swensen, R. G.....Harris
Vik, Melvin.....Onamia
Wasson, L. F.....Chisago City

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly

Annual meeting, December

Number of Members: 23

President

Barr, L. C.....Albert Lea

Secretary

Prins, L. R.....Albert Lea

Barr, L. C.....Albert Lea
Branham, D. S.....Albert Lea
Burns, H. D.....Albert Lea

Buttuff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea
Donovan, D. L.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Albert Lea
Freight, W. P.....Albert Lea
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gullixson, A. E.....Albert Lea
Jerome, Bourne.....Philadelphia, Pa.

Kaasa, L. J.....Albert Lea
Kamp, B. A.....Albert Lea
Leopard, B. A.....Albert Lea
Manley, L. V.....Northampton, Mass.
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Prins, L. R.....Albert Lea
Schultz, J. A.....Albert Lea
Trombley, R. A.....Emmons
Whitson, S. A.....Allden

GOODHUE COUNTY MEDICAL SOCIETY

Regular meetings, none

Annual meeting, December

Number of Members: 21

President

Graves, R. B.....Red Wing

Secretary

Juers, E. H.....Red Wing

Aanes, A. M.....Red Wing
Anderson, S. H.....Red Wing
Brusegard, J. F.....Red Wing

Claydon, D. R.....Red Wing
Claydon, H. F.....Zumbrota
Claydon, L. E.....Red Wing
Flom, M. G.....Zumbrota
Graves, R. B.....Red Wing
Hartnagel, G. F.....Red Wing
Hedin, R. F.....Chicago, Ill.
Johnson, A. E.....Red Wing
Jones, A. W.....Red Wing

Juers, E. H.....Red Wing
Liffing, W. W.....Goodhue
Mack, J. J.....Little Rock, Ark.
McGuigan, H. T.....Red Wing
Miller, F. J.....Spokane, Wash.
Smith, M. W.....Red Wing
Steffens, L. A.....Red Wing
Vaaler, T.....Cannon Falls
Williams, M. R.....Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday each month excepting June, July, August and September

Annual meeting, October

Number of Members: 599

President

Ulrich, H. L.....Minneapolis

Secretary

Campbell, O. J.....Minneapolis

Abramson, Milton.....Minneapolis
Alexander, H. A.....Minneapolis
Aling, C. A.....Minneapolis
Allen, H. W.....Minneapolis
Allison, R. G.....Minneapolis
Altrow, H. O.....Minneapolis
Andersen, A. G.....Minneapolis
Andersen, S. C.....Minneapolis
Andersen, D. D.....Minneapolis
Andersen, E. D.....Minneapolis
Andersen, E. R.....Minneapolis
Andersen, F. J.....Minneapolis
Andersen, J. K.....Minneapolis
Anderson, K. W.....Minneapolis
Anderson, P. A.....Minneapolis
Anderson, U. S.....Minneapolis
Andreassen, E. C.....Minneapolis
Andrews, R. S.....Minneapolis
Annis, H. B.....Minneapolis
Arey, S. L.....Excelsior
Arlander, C. E.....Minneapolis
Arling, L. S.....Minneapolis
Arnold, A. W.....Minneapolis
Arnold, D. C.....Minneapolis
Arvidson, C. G.....Minneapolis
Anne, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Baken, M. T.....Minneapolis
Baker, A. T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Loee.....Minneapolis
Barber, J. P.....Minneapolis
Barron, Moses.....Minneapolis
Bass, G. W.....Minneapolis

Baxter, S. H.....Minneapolis
Bayard, H. F.....Minneapolis
Beard, A. H.....Minneapolis
Beckman, W. G.....Minneapolis
Bedford, E. W.....Minneapolis
Bell, E. T.....Minneapolis
Belzer, M. S.....Minneapolis
Benjamin, A. E.....Minneapolis
Benjamin, E. G.....Minneapolis
Benjamin, H. G.....Minneapolis
Benn, F. G.....Minneapolis
Berger, A. G.....Minneapolis
Bergh, G. S.....Minneapolis
Berkwitz, N. J.....Minneapolis
Berman, Reuben.....Minneapolis
Bessesen, A. N., Jr.....Minneapolis
Bessesen, W. A.....Minneapolis
Blake, James.....Hopkins
Blake, J. A.....Hopkins
Blaustone, H. H.....Minneapolis
Bloedel, T. J. G.....Minneapolis
Bockman, M. W. H.....Minneapolis
Boehme, E. J.....Minneapolis
Boies, L. R.....Minneapolis
Booth, L. R.....Minneapolis
Boreen, C. A.....Minneapolis
Borgeson, E. J.....Minneapolis
Borman, C. N.....Minneapolis
Bouman, H. A. H.....Minneapolis
Boynton, Ruth.....Minneapolis
Bracken, H. M.....Claremont, Calif.
Bratrud, A. F.....Minneapolis
Brooks, C. N.....Minneapolis
Brown, E. D.....Paynesville
Brown, E. J.....Minneapolis
Brutsch, G. J.....Minneapolis
Bryant, F. L.....Minneapolis
Bryant, O. R.....Minneapolis
Bulkley, Kenneth.....Minneapolis

Bullard, M. J.....Minneapolis
Butler, John.....Minneapolis
Buzzelle, L. K.....Minneapolis
Cable, M. L.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Callerstom, G. W.....Minneapolis
Cameron, Isabell.....Minneapolis
Camp, W. E.....Minneapolis
Campbell, L. M.....Minneapolis
Campbell, O. J.....Minneapolis
Cardle, A. E.....Minneapolis
Carey, J. B.....Minneapolis
Carlaw, C. M.....Minneapolis
Carlson, Lawrence.....Minneapolis
Carlson, L. T.....Minneapolis
Caron, R. P.....Minneapolis
Cavanor, F. T.....Minneapolis
Chesley, A. J.....Minneapolis
Christenson, G. R.....Minneapolis
Christianson, H. W.....Minneapolis
Clark, H. S.....Minneapolis
Clay, L. B.....Minneapolis
Cohen, B. A.....Minneapolis
Cohen, S. S.....Oak Terrace
Condit, W. H.....Minneapolis
Cook, H. W.....Minneapolis
Corbett, J. F.....Minneapolis
Corniea, A. D.....Minneapolis
Cottam, Gilbert.....Minneapolis
Crafts, L. M.....Minneapolis
Cranmer, R. R.....Minneapolis
Cranston, R. W.....St. Louis Park
Creedy, C. D.....Minneapolis
Creighton, R. H.....Minneapolis
Curtin, J. F.....Minneapolis
Cuttis, George.....Minneapolis
Cuttis, R. E.....Minneapolis
Dady, E. E.....Minneapolis

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

Dahl, E. O.	Minneapolis	Haverfield, A. R.	Minneapolis	Leonard, L. J.	Minneapolis
Dahl, J. A.	Minneapolis	Hawkinson, R. P.	Minneapolis	Leonard, Sam.	Minneapolis
Daniel, D. H.	Minneapolis	Hayes, J. M.	Minneapolis	Lillehei, E. J.	Robbinsdale
Daniel, L. M.	Minneapolis	Head, D. P.	Minneapolis	Lind, C. J.	Minneapolis
del Plaine, C. W.	Minneapolis	Head, G. D.	Minneapolis	Lindgren, R. C.	Minneapolis
Devereaux, T. J.	Wayzata	Hedback, A. E.	Minneapolis	Lindquist, R. H.	Minneapolis
Diehl, H. S.	Minneapolis	Heim, R. R.	Minneapolis	Linner, H. P.	Minneapolis
Diessner, H. D.	Minneapolis	Helk, H. R.	Minneapolis	Linton, W. B.	Minneapolis
Doering, R. E.	Minneapolis	Hendricks, E. J.	Minneapolis	Lippman, E. S.	Minneapolis
Dorge, R. I.	Minneapolis	Hendrickson, J. F.	Minneapolis	Lipschultz, Oscar.	Minneapolis
Dornblaser, H. B.	Minneapolis	Henrikson, E. C.	Minneapolis	Litman, A. B.	Minneapolis
Dorsey, G. C.	Minneapolis	Henry, C. E.	Minneapolis	Litzenberg, J. C.	Minneapolis
Doxey, G. L.	Minneapolis	Henry, M. O.	Minneapolis	Logeifeil, R. C.	Minneapolis
Doyle, L. O.	Minneapolis	Herbolsheimer, A. J.	Minneapolis	Long, Jesse.	Minneapolis
Drake, C. R.	Minneapolis	Herbst, R. F.	Minneapolis	Loomis, E. A.	Minneapolis
Drill, H. E.	Hopkins	Herman, A. L.	Minneapolis	Lufkin, N. H.	Minneapolis
Duff, E. R.	Minneapolis	Hiebert, J. P.	Minneapolis	Lundberg, R. I.	Minneapolis
Dukelow, D. A.	Minneapolis	Higgins, J. H.	Minneapolis	Lundblad, R. A.	Minneapolis
Dumas, A. G.	Minneapolis	Hill, E. J.	Minneapolis	Lundgren, A. C.	Minneapolis
Dunlap, E. H.	Minneapolis	Hirschfelder, A. D.	Minneapolis	Lundquist, E. F.	Minneapolis
Dunn, G. R.	Minneapolis	Hirschfield, F. R.	Minneapolis	Lynch, M. J.	Minneapolis
Duryea, W. M.	Minneapolis	Hoaglund, A. W.	Minneapolis	Lysne, Henry.	Minneapolis
Dutton, C. E.	Minneapolis	Hobbs, C. W.	Minneapolis	Lysne, Myron.	Minneapolis
Dworak, B. A.	Minneapolis	Hodge, S. V.	Minneapolis	MacDonald, A. E.	Minneapolis
Dwan, P. F.	Minneapolis	Hoffert, H. E.	Minneapolis	MacDonald, D. A.	Minneapolis
Dworsky, S. D.	Minneapolis	Holl, P. M.	Minneapolis	MacDonald, I. C.	Minneapolis
Eckhardt, C. L.	Minneapolis	Holmberg, C. J.	Minneapolis	Mach, F. B.	Minneapolis
Ehrenberg, C. J.	Minneapolis	Holt, W. B.	Minneapolis	Macnie, J. S.	Minneapolis
Ehrlich, S. P.	Minneapolis	Houkom, Bjarne.	Minneapolis	Maeder, E. C.	Minneapolis
Eich, Matthew.	Minneapolis	Hovland, M. L.	Minneapolis	Maland, C. O.	Minneapolis
Eisenstadt, D. H.	Minneapolis	Huenekens, E. J.	Minneapolis	Mariette, E. S.	Oak Terrace
Eitel, G. D.	Minneapolis	Hultkrans, J. C.	Minneapolis	Mark, D. B.	Minneapolis
Elitson, D. E.	Minneapolis	Hultkrans, E. E.	Minneapolis	Martinson, C. J.	Wayzata
Engstrand, O. J.	Minneapolis	Hurd, Annah.	Minneapolis	Matchan, G. R.	Minneapolis
Erdmann, C. A.	Minneapolis	Hutchinson, C. C.	Minneapolis	Matthews, Justus.	Minneapolis
Erickson, R. F.	Minneapolis	Hymes, Charles.	Minneapolis	Mattill, P. M.	Oak Terrace
Ericson, R. M.	Minneapolis	Hynes, J. E.	Minneapolis	Mattson, Hamlin.	Minneapolis
Evans, E. T.	Minneapolis	Irvine, H. G.	Minneapolis	Maxeiner, S. R.	Minneapolis
Evans, R. D.	Minneapolis	Jackson, C. M.	Minneapolis	May, W. H.	Minneapolis
Fansler, W. A.	Minneapolis	Jennings, F. L.	Oak Terrace	McCarthy, Donald.	Minneapolis
Feeney, J. M.	Minneapolis	Jennings, M. H.	Minneapolis	McCartney, J. S.	Minneapolis
Fenger, E. P. K.	Oak Terrace	Jensen, Harry.	Minneapolis	McDaniel, Orianna.	Minneapolis
Fink, L. W.	Minneapolis	Jensen, M. J.	Minneapolis	McFarland, A. H.	Minneapolis
Fink, W. H.	Minneapolis	Johnson, A. B.	Minneapolis	McGandy, R. F.	Minneapolis
Fitzgerald, D. F.	Minneapolis	Johnson, A. E.	Minneapolis	McGarry, G. E.	Minneapolis
Fieldstad, C. A.	Minneapolis	Johnson, E. W.	Minneapolis	McIntyre, George.	Minneapolis
Fleming, A. S.	Minneapolis	Johnson, H. A.	Minneapolis	McKenzie, C. H.	Minneapolis
Ford, W. H.	Minneapolis	Johnson, J. A.	Minneapolis	McKinlay, C. A.	Minneapolis
Foster, W. K.	Minneapolis	Johnson, Julius.	Minneapolis	McKinley, J. C.	Minneapolis
Fowler, L. H.	Minneapolis	Johnson, N. A.	Minneapolis	McKinney, F. S.	Minneapolis
Fredericks, G. M.	Minneapolis	Johnson, Norman.	Minneapolis	McPheeters, H. O.	Minneapolis
Friedell, Aaron.	Minneapolis	Johnson, N. T.	Minneapolis	McQuarrie, Irvine.	Minneapolis
Fritzell, K. E.	Minneapolis	Johnson, R. A.	Minneapolis	Meland, E. L.	Minneapolis
Funk, V. K.	Oak Terrace	Johnson, R. E.	Minneapolis	Merkert, C. E.	Minneapolis
Gammell, J. H.	Minneapolis	Johnson, S. M.	Minneapolis	Merkert, G. L.	Minneapolis
Gardner, E. L.	Minneapolis	Johnson, Y. T.	Minneapolis	Merrill, Elisabeth.	Minneapolis
Giere, E. O.	Minneapolis	Jones, G. M.	Minneapolis	Meyer, E. L.	Minneapolis
Giere, J. C.	Minneapolis	Jones, H. W.	Minneapolis	Michael, T. C.	Minneapolis
Giere, R. W.	Minneapolis	Jones, W. R.	Minneapolis	Michael, H. H.	Minneapolis
Giessler, P. W.	Minneapolis	Josewich, Alexander.	Minneapolis	Michelson, H. E.	Minneapolis
Gilles, F. L.	Minneapolis	Kalin, O. T.	Minneapolis	Miller, H. E.	Minneapolis
Gingold, B. A.	Minneapolis	Kelby, G. M.	Minneapolis	Miller, J. C.	Minneapolis
Girvin, R. B.	Minneapolis	Kennedy, C. C.	Minneapolis	Milton, J. S.	Minneapolis
Golberg, M. L.	Minneapolis	Kennedy, J. F.	Minneapolis	Mitchell, E. C.	Mound
Goldberg, I. M.	Minneapolis	Kerkhof, A. C.	Minneapolis	Moe, J. H.	Minneapolis
Goldman, T. I.	Minneapolis	Kertesz, G.	Minneapolis	Moir, W. W.	Minneapolis
Good, H. D.	Minneapolis	Kibbe, O. A.	Minneapolis	Monson, E. M.	Minneapolis
Gordon, P. E.	Minneapolis	King, E. A.	Minneapolis	Moorhead, M. B.	Minneapolis
Gratzek, F. R.	Minneapolis	King, H. T.	Minneapolis	Moren, Edward.	Minneapolis
Grave, Floyd.	Minneapolis	Kinsella, T. J.	Minneapolis	Moriarty, C. R.	Minneapolis
Gray, R. C.	Minneapolis	Kistler, A. J.	Minneapolis	Morrison, A. W.	Minneapolis
Grimes, Marian.	Minneapolis	Kistler, C. M.	Minneapolis	Morse, R. W.	Minneapolis
Gronvall, P. R.	Minneapolis	Knapp, M. E.	Minneapolis	Morton, H. McL.	Minneapolis
Gunderson, N. A.	Minneapolis	Knight, R. R.	Minneapolis	Murphy, E. P.	Minneapolis
Gunlaugson, F. G.	Baltimore, Md.	Knight, R. T.	Minneapolis	Murphy, I. J.	Minneapolis
Gushurst, E. G.	Minneapolis	Koepcke, G. M.	Minneapolis	Myers, J. A.	Minneapolis
Gustason, H. T.	Minneapolis	Koller, H. M.	Minneapolis	Neal, J. M.	Minneapolis
Hacking, F. H.	Minneapolis	Koller, L. R.	Minneapolis	Nearly, R. P.	Minneapolis
Haggard, G. D.	Minneapolis	Korchik, J. P.	Minneapolis	Neilson, H. F.	Minneapolis
Hall, J. M.	Minneapolis	Kucera, F. J.	Hopkins	Neilson, H. S.	Minneapolis
Hallberg, C. A.	Minneapolis	Kucera, W. J.	Minneapolis	Nelson, Harvey.	Minneapolis
Hallock, Philip.	Minneapolis	Lagersen, R. W.	Minneapolis	Nelson, O. E.	Minneapolis
Hamel, A. L.	Minneapolis	Lajoie, J. M.	Minneapolis	Nelson, O. L. N.	Minneapolis
Hamilton, A. S.	Minneapolis	Lang, L. A.	Minneapolis	Newhart, Horace.	Minneapolis
Hamlin, G. B.	Minneapolis	Lapierre, A. P.	Minneapolis	Nordin, G. T.	Minneapolis
Hammond, A. J.	Minneapolis	Lapierre, C. A.	Minneapolis	Nordland, Martin.	Minneapolis
Hannah, H. B.	Minneapolis	Lapierre, J. T.	Minneapolis	Norris, E. H.	Minneapolis
Hansen, C. O.	Minneapolis	Larsen, F. W.	Minneapolis	Noth, H. W.	Minneapolis
Hansen, E. W.	Minneapolis	Larson, C. M.	Minneapolis	Nydahl, M. J.	Minneapolis
Hansen, O. S.	Minneapolis	Larson, L. M.	Minneapolis	Nystrom, Ruth.	Minneapolis
Hanson, H. J.	Minneapolis	Larson, L. M.	Oak Terrace	Oberg, C. M.	Minneapolis
Hanson, H. V.	Minneapolis	La Vake, R. N.	Minneapolis	O'Brien, W. A.	Minneapolis
Hanson, M. B.	Minneapolis	Laymon, C. W.	Minneapolis	O'Donnell, J. E.	Minneapolis
Hanson, W. A.	Minneapolis	Leavitt, H. A.	Minneapolis	Olsen, E. G.	Minneapolis
Harrington, C. D.	Minneapolis	Lebowski, J. H.	Minneapolis	Olsen, A. C.	Minneapolis
Harrington, F. E.	Minneapolis	Leclercq, G. T. A.	Minneapolis	Olson, F. A.	Minneapolis
Hart, V. L.	Minneapolis	Lee, H. M.	Minneapolis	Olson, O. A.	Minneapolis
Hartzell, T. B.	Minneapolis	Leland, H. R.	Minneapolis	Olson, R. G.	Minneapolis
Hastings, D. R.	Minneapolis	Lenz, O. A.	Minneapolis	Oppen, E. G.	Minneapolis
Haven, W. K.	Minneapolis			Owre, Oscar.	Minneapolis

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

Parks, A. H.	Minneapolis	Salt, C. G.	Minneapolis	Sweitzer, S. E.	Minneapolis
Patterson, W. E.	Minneapolis	Samuelson, Samuel	Minneapolis	Swendesen, C. G.	Minneapolis
Paulsen, E. L.	Minneapolis	Sandt, K. E.	Minneapolis	Taylor, J. H.	Minneapolis
Pederson, R. M.	Minneapolis	Sawatzky, W. A.	Minneapolis	*Ternstrom, O. H.	Minneapolis
Pennington, Reuben	Minneapolis	Schaaf, F. H. K.	Minneapolis	Thomas, G. E.	Minneapolis
Peppard, T. A.	Minneapolis	Schaefer, W. G.	Minneapolis	Thomas, G. H.	Minneapolis
Petersen, J. R.	Minneapolis	Scheldrup, N. H.	Minneapolis	Thomas, G. J.	Minneapolis
Petersen, Thorvald	Minneapolis	Scherer, L. R.	Minneapolis	Thompson, H. H.	Minneapolis
Petersen, Henry	Minneapolis	Schmidt, G. F.	Minneapolis	Tingdale, A. C.	Wayzata
Petersen, H. O.	Minneapolis	Schmitt, A. F.	Minneapolis	Trueman, H. S.	Minneapolis
Petersen, H. W.	Minneapolis	Schmitt, S. C.	Los Angeles, Calif.	Tunstead, H. J.	Minneapolis
Petersen, O. H.	Minneapolis	Schneider, J. P.	Minneapolis	Turnachiff, D. D.	Minneapolis
Petersen, P. E.	Minneapolis	Schottler, M. E.	Minneapolis	Tyrrell, C. C.	Minneapolis
Petersson, W. C.	Minneapolis	Schultz, P. J.	Minneapolis	Ude, W. H.	Minneapolis
Petit, L. J.	Minneapolis	Schussler, O. F.	Minneapolis	Ulrich, H. L.	Minneapolis
Peyton, W. T.	Minneapolis	Schwartz, V. J.	Minneapolis	Undine, C. A.	Minneapolis
Plunder, M. C.	Minneapolis	Schwyzler, Gustav	Minneapolis	Wahlquist, H. F.	Minneapolis
Phipps, K. A.	Minneapolis	Scott, F. H.	Minneapolis	Walch, A. E.	Minneapolis
Platou, E. S.	Minneapolis	Scott, H. G.	Minneapolis	Waldron, C. W.	Minneapolis
Pollard, D. W.	Minneapolis	Seashore, Gilbert	Minneapolis	Wall, C. R.	Minneapolis
Pollock, D. K.	Minneapolis	Selham, Max	Minneapolis	Wangensten, O. H.	Minneapolis
Polzak, J. A.	Minneapolis	Seliefert, M. H.	Excelsior	Wancus, E. Z.	Minneapolis
Poppe, F. H.	Minneapolis	Selleseth, I. F.	Minneapolis	Ward, A. W.	Minneapolis
Pratt, F. J.	Minneapolis	Shaperman, E. P.	Minneapolis	Ward, P. A.	Minneapolis
Pratt, I. A.	Minneapolis	Shapiro, M. J.	Minneapolis	Warham, T. T.	Minneapolis
Preine, I. A.	Minneapolis	Sharp, D. V.	Minneapolis	Watson, J. A.	Minneapolis
Prim, J. A.	Minneapolis	Siegmann, W. C.	Minneapolis	Webb, R. C.	Minneapolis
Proschek, C. E.	Minneapolis	Silver, J. D.	Minneapolis	Weisman, S. A.	Minneapolis
Quello, R. O. B.	Minneapolis	Simons, J. H.	Minneapolis	Westman, R. T.	Minneapolis
Quinby, T. F.	Lake Wales, Florida	Simpson, E. D.	Minneapolis	Wethall, A. G.	Minneapolis
Quist, H. W.	Minneapolis	Siperstein, D. M.	Minneapolis	Wetherby, Macnider	Minneapolis
Rasmussen, R. C.	Minneapolis	Sivertsen, Andrew	Minneapolis	Weum, T. W.	Minneapolis
Reed, C. A.	Minneapolis	Sivertsen, Ivar	Minneapolis	White, A. A.	Minneapolis
Regnier, E. A.	Minneapolis	Skjold, A. C.	Minneapolis	White, S. M.	Minneapolis
Rewbridge, A. G.	Minneapolis	Sloan, Julius	Minneapolis	White, W. D.	Minneapolis
Reynolds, J. S.	Minneapolis	Smisek, F. M.	Minneapolis	Whitesell, L. A.	Minneapolis
Rice, C. O.	Minneapolis	Smith, A. E.	Minneapolis	Widen, W. F.	Minneapolis
Richardson, F. S.	Minneapolis	Smith, A. M.	Minneapolis	Wilcox, A. E.	Minneapolis
Richdorf, L. F.	Minneapolis	Smith, H. R.	Minneapolis	Wilder, K. W.	Minneapolis
Rieke, W. W.	Wayzata	Smith, N. M.	Minneapolis	Wilder, R. L.	Minneapolis
Rigler, L. G.	Minneapolis	Soderlind, R. T.	Minneapolis	Wilken, P. A.	Minneapolis
Rishmiller, J. H.	Minneapolis	Solhaug, S. B.	Minneapolis	Willcutt, C. E.	Minneapolis
Rizer, R. L.	Minneapolis	Spano, J. P.	Minneapolis	Williams, Robert	Minneapolis
Roon, C. M.	Minneapolis	Sperling, Louis	Minneapolis	Winer, L. H.	Minneapolis
Robb, E. F.	Minneapolis	Spratt, C. N.	Minneapolis	Winther, Nora	Minneapolis
Robbins, O. F.	Minneapolis	Stanford, C. E.	Minneapolis	Witham, C. A.	Minneapolis
Roberts, S. W.	Minneapolis	Stelter, L. A.	Minneapolis	Wittich, F. W.	Minneapolis
Roberts, T. S.	Minneapolis	Stenstrom, A. T.	Minneapolis	Wohlraabe, A. A.	Minneapolis
Roberts, W. B.	Minneapolis	Stewart, C. A.	Minneapolis	Wohlraabe, C. F.	Minneapolis
Robitshch, E. C.	Minneapolis	Stewart, R. I.	Minneapolis	Woodworth, Elizabeth	Minneapolis
Rochford, W. E.	Minneapolis	Stomel, Joseph	Minneapolis	Wright, C. B.	Minneapolis
Rodda, F. C.	Minneapolis	Strachauer, A. C.	Minneapolis	Wright, C. D.	Minneapolis
Rodgers, C. L.	Minneapolis	Strout, E. S.	Minneapolis	Wright, F. R.	Minneapolis
Rosen, Samuel	Minneapolis	Strout, G. E.	Minneapolis	Wright, S. G.	Minneapolis
Rosenwald, R. M.	Minneapolis	Sturte, J. R.	Minneapolis	Wright, W. S.	Minneapolis
Rucker, W. H.	Minneapolis	Sullivan, R. M.	Minneapolis	Wyatt, O. S.	Minneapolis
Rud, N. E.	Minneapolis	Sullivan, R. R.	Minneapolis	Wynne, H. M. N.	Minneapolis
Ruddell, G. L.	Minneapolis	Sundt, Mathias	Minneapolis	Ylvisaker, R. S.	Minneapolis
Ruseth, A. N.	Minneapolis	Swanson, Cephas	Minneapolis	Yoerg, O. W.	Minneapolis
Rusten, E. M.	Minneapolis	Swanson, R. E.	Minneapolis	Zaworski, E. A.	Minneapolis
Sadler, W. P.	Minneapolis	Sweetser, H. B., Jr.	Minneapolis	Zierold, A. A.	Minneapolis
St. Cyr, K. J.	Osseo	Sweetser, T. H.	Minneapolis	Ziskin, Thomas	Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday of month

Annual meeting, December

Number of Members: 35

President		Danielson, K. A.	Litchfield	Jensen, H. H.	Atwater
Petersen, M. C.		Danielson, Lennox	Litchfield	Johnson, Hans	Kerkhoven
Secretary		Dowswell, W. J.	Kerkhoven	Kaufman, E. J.	Appleton
		Dulude, S. S.	Dassel	Kaufman, W. C.	Appleton
Scofield, C. L.		Fredrickson, A. C.	Lake Lillian	Lutz, E. H.	Willmar
		Fredrickson, G. U. Y.	Lake Lillian	Macklin, W. E.	Litchfield
Anderson, L. W.		Frisch, F. P.	Willmar	Nelson, K. L.	Willmar
		Frost, E. H.	Willmar	O'Connor, D. C.	Eden Valley
Anderson, R. E.		Giere, S. W.	Benson	Petersen, M. C.	Willmar
Anson, J. M.		Hedlund, C. J.	Atwater	Proeschel, R. K.	Willmar
Branton, A. F.		Hodapp, R. J.	Willmar	Scofield, C. L.	Benson
Branton, B. J.		Hutchinson, Henry	Willmar	Telford, V. J.	Litchfield
Brigham, Frank		Jacobs, D. L.	Willmar	Wilmot, C. A.	Litchfield
Daignault, Oscar		Jacobs, J. C.	Willmar	Wilmot, H. E.	Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month Spring and Fall

Annual meeting, first Tuesday in November

Number of Members: 22

President		Ford, B. C.	Marshall	Potter, R. B.	Hendricks
Helferty, J. K.		Germo, Charles	Balaton	Purves, G. H.	Lake Benton
Secretary		*Golden, C. M.	Tyler	Robertson, J. B.	Minneapolis
		Gray, F. D.	Marshall	Sanderson, E. T.	Minneota
Workman, W. G.		Helferty, J. K.	Tracy	Schmidt, P. G.	Granite Falls
Akester, Ward		Hermanson, P. E.	Hendricks	Smith, L. A.	Balaton
		Hoidale, A. D.	Tracy	Thordarson, Theodore	Minneota
Bossingham, O. N.		Jacquot, G. L.	Marshall	Vadheim, A. L.	Tyler
Erickson, A. O.		Johnson, P. C.	Tyler	Valentine, W. H.	Tracy
*Deceased.		Monson, L. J.	Canby	Workman, W. G.	Tracy
		Persons, C. E.	Marshall	Yaeger, W. W.	Marshall

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, first Thursday of month
Annual meeting, January
Number of Members: 19

President
Goss, H. C. Glencoe
Secretary
Sahr, W. G. Hutchinson
Clement, J. B. Lester Prairie
Fine, B. A. Winsted
Goss, H. C. Glencoe

Holm, H. H. Glencoe
Jensen, A. H. Hutchinson
Jensen, A. M. Brownston
Klima, W. W. Stewart
Langhoff, A. H. Glencoe
Lippmann, E. W. Hutchinson
McMahon, M. J. Green Isle
Ninneman, N. N. Silver Lake

Sahr, W. G. Hutchinson
Schmidt, W. R. Glencoe
Scholpp, O. W. Hutchinson
Sheppard, C. G. Hutchinson
Sheppard, Fred Hutchinson
Sheppard, P. E. Hutchinson
Tinker, C. W. Stewart
Trutna, T. J. Silver Lake

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of month
Annual meeting, Tuesday before last Thursday in November
Number of Members: 26

President
Leck, P. C. Austin
Secretary
Robertson, P. A. Austin
Allen, A. W. Austin
Allen, C. W. Austin
Allen, H. B. Austin
Cronwell, B. J. Austin
Flanagan, L. G. Austin
Grise, W. B. Austin

Havens, J. G. W. Austin
Hegge, O. H. Austin
Hegge, R. S. Austin
Henslin, A. E. Le Roy
Hertel, G. E. Austin
Johnson, O. J. Lyle
Kibler, F. E. Austin
Leck, P. C. Austin
Lommen, P. A. Austin
McKenna, J. K. Austin

Melzer, G. R. Lyle
Mitchell, R. S. Grand Meadow
Morrow, J. J. Austin
Morse, M. P. Le Roy
Robertson, P. A. Austin
Rosenthal, F. H. Grand Meadow
Schneider, P. J. Adams
Schottler, G. J. Dexter
Sheedy, C. L. Austin
Thomson, J. M. Brownsdale

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday, April, September, and December
Annual meeting, first Tuesday in December
Number of Members: 21

President
Kerschbaumer, Louisa. St. Peter
Secretary
Lenander, M. E. St. Peter
Aitkens, H. B. Le Center
Covell, W. W. St. Peter
Curtis, R. A. Le Center

Ericson, Swan. Le Sueur
Freeman, G. H. St. Peter
Grimes, B. P. St. Peter
Gully, R. J. St. Peter
Hiniker, F. J. Le Sueur
Holman, Theodore. Waterville
Kerschbaumer, Louisa. St. Peter
Kolars, J. J. Le Center
Lenander, M. E. St. Peter

Nilson, H. J. North Mankato
Nissen, A. S. St. Peter
Olmanson, E. G. St. Peter
Rosen, R. X. St. Peter
Sonnesyn, N. N. Le Sueur
Strathern, C. S. St. Peter
Strathern, F. P. St. Peter
Traxler, F. J. Henderson
Wolner, O. H. St. Peter

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular meetings, first Wednesday every odd month
Annual meeting, November
Number of Members: 381

President
Piper, M. C. Rochester
Secretary
Anderson, M. J. Rochester
Adams, R. C. Rochester
Adson, A. W. Rochester
Affeldt, D. E. Kasson
Ahlf, J. J. Caledonia
Allen, E. W. Rochester
Alvarez, W. Rochester
Amberg, Samuel Rochester
Anderson, M. J. Rochester
Anderson, N. E. Harmony
Annis, J. W. Rochester
Archer, G. F., Jr. Rochester
Army, F. P. Preston
Baggenstoss, A. H. Rochester
Bailey, R. J. Spokane, Wash.
Bair, H. L. Rochester
Baker, G. S. Rochester
Baker, H. R. Hayfield
Baker, R. L. Hayfield
Balfour, D. C. Rochester
Bannick, E. G. Seattle, Wash.
Bargen, J. A. Rochester
Barker, N. W. Rochester
Barnes, A. R. Rochester
Bedard, R. E. Rochester
Beiswanger, R. H. Wykoff
Beizer, L. H. Rochester
Belote, G. B. Caledonia
Benedict, W. L. Rochester
Bennett, R. L., Jr. Rochester
Benson, K. W. Rochester
Berkman, D. M. Rochester
Berkman, J. M. Rochester
Betlach, C. J. Rochester
Bigelow, C. E. Dodge Center
Binger, M. W. Rochester
Birge, H. L. Rochester
Black, B. M. Rochester
Black, J. R. Rochester
Blake, T. W. Seattle, Wash.
Blum, B. B. Rochester
Boland, E. W. Rochester
Boothby, W. M. Rochester
Bowling, H. H. Rochester
Braasch, W. F. Rochester

Broders, A. C. Rochester
Brown, A. E. Rochester
Brown, P. W. Rochester
Brown, R. W. Rochester
Browne, H. C., Jr. Rochester
Brumm, H. J. Rochester
Brunsting, L. A. Rochester
Buchstein, H. F. Rochester
Buie, L. A. Rochester
Burchell, H. B. Rochester
Bussey, C. D. Rochester
Butt, H. R. Rochester
Cabell, C. L. Rochester
Cabot, Hugh Rochester
Cady, J. B. Rochester
Cameron, D. M. Rochester
Camp, J. D. Rochester
Campbell, S. J. Rochester
Canhnel, W. W. Houston
Carmichael, F. A., Jr. Rochester
Chauncey, L. R. Rochester
Chew, E. M. Rochester
Clagett, O. T. Rochester
Clark, L. W. Spring Valley
Clark, R. L., Jr. Rochester
Cleveland, W. H. Rochester
Clifton, T. A. Chatfield
Coffey, R. J. Rochester
Comfort, M. W. Rochester
Conner, H. M. Rochester
Conway, J. F. Rochester
Cook, E. N. Rochester
Corwin, W. C. Rochester
Counsellor, V. S. Rochester
Cragg, R. W. Rochester
Craig, W. McK. Rochester
Crenshaw, J. L. Rochester
Crewe, J. E. Rochester
Crumpacker, L. K. Rochester
Cusick, P. L. Rochester
Cutler, H. H. Rochester
Davis, A. C. Rochester
Davis, I. G. Rochester
Day, L. A. Rushford
Dearing, W. H., Jr. Rochester
Deeds, C. D. Rochester
Delmonico, E. J. Rochester
Desjardins, A. U. Rochester
Deuterman, J. L. Elgin, Ill.

Dickson, D. D. Rochester
Dix, C. R. Rochester
Dixon, C. F. Rochester
Dockerty, M. B. Rochester
Dolder, F. C. Eyota
Donath, D. H. Rochester
Drips, D. G. Rochester
Dry, T. J. Rochester
Eaton, L. McK. Rochester
Ecker, A. D. Rochester
Elkins, E. C. S. Rochester
Emmett, J. I. Rochester
Engle, D. E. Rochester
Erich, J. B. Rochester
Erickson, C. W. Rochester
Eusterman, G. B. Rochester
Evarts, A. B. Rochester
Faber, J. E. Rochester
Fairchild, R. D. Rochester
Fairthing, J. W. Rochester
Farrerree, T. J., Jr. Rochester
Fawcett, C. E. Stewartville
Figg, F. A. Rochester
Foley, M. P. Rochester
Foster, F. P. Rochester
Fricke, R. E. Rochester
Friedell, M. T. Rochester
Furey, E. D. Rochester
Gaarde, F. W. Rochester
Ghormley, R. K. Rochester
Gibson, W. R. Rochester
Giffin, H. Z. Rochester
Gober, O. B. Rochester
Goldstein, Moe Rochester
Good, C. A., Jr. Rochester
Goodson, W. H., Jr. Rochester
Graham, R. W. Rochester
Gray, H. K. Rochester
Gregg, R. O. Rochester
Grindlay, J. H. Rochester
Grinnell, W. B. Preston
Groff, J. E. Rochester
Guernsey, C. M. Rochester
Habein, H. C. Rochester
Haines, D. J., Jr. Rochester
Haines, S. F. Rochester
Hall, B. E. Rochester
Hallenbeck, D. F. Rochester

Hammer,
Harrington
Hartman,
Havens, F.
Hawn, H.
Heck, F.
Helman,
Helman,
Heland, C.
Heland, C.
Helm, St.
Helmholz,
Hempstead
Hench, P.
Henderson
Hendrick,
Herrell, V.
Hertz, C.
Hewitt, E.
Hewitt, E.
Hoyerdale
Hoyerdale
Hildebrand
Hines, E.
Hinshaw,
Hodgson,
Hollister,
Holman,
Horton,
Howell,
Hubby, J.
Hunt, A.
Jackman,
Jensen, R.
Jewett, F.
Johnson,
Johnson,
Joyce, G.
Judd, E.
Jump, F.
Kabel, J.
Kearney,
Keith, N.
Kelly, H.
Kemble,
Kendrick,
Kennedy,
Kepler,
Kermott,
Kermohar
Kerr, J.
Kierland
Kirklind,
Kirklind,
Koch, E.
Koch, F.
Koelsche
Kowallis,
Krusen,
Kvale, G.
Lard, D.
Lannin,
Leddy,
Lemon,
Lemon,
Lewis, M.
Lillie, F.
Lipscomb
Lloyd, S.
Lochead
Logan,
Logan,
Lord, C.
Love, J.
Lovelace
Lovelad
Luden,
Lundy,
Macey,
MacKay

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

Hammer, H. J.	Rochester	MacLean, A. R.	Rochester	Rushton, J. G.	Rochester
Harrington, S. W.	Rochester	Madding, G. F.	Rochester	Rutledge, D. L.	Rochester
Hartman, H. R.	Rochester	Magath, T. B.	Rochester	Rynearson, E. H.	Rochester
Havens, F. Z.	Rochester	Maksim, George, Jr.	Rochester	Sanford, A. H.	Rochester
Hawn, H. W.	Rochester	Mann, A. S., Jr.	Rochester	Sawyer, M. H.	Rochester
Hick, F. J.	Rochester	Mann, F. C.	Rochester	Schmidt, H. W.	Rochester
Hickman, D. M. H.	Rochester	Marley, D. M.	Rochester	Schneider, H. H.	Rochester
Hickman, F. R.	Rochester	Masson, D. M.	Rochester	Searles, P. W.	Rochester
Holland, G. M.	Spring Grove	Masson, J. C.	Rochester	Secord, E. W.	Rochester
Holland, J. W.	Spring Grove	Matthews, M. W.	Rochester	Seedorf, E. E.	Rochester
Helm, Standiford	Rochester	Mayo, C. H.	Rochester	Seldon, T. H.	Rochester
Helmholz, H. F.	Rochester	Mayo, C. W.	Rochester	Sheedy, L. P.	Rochester
Hempstead, B. E.	Rochester	Mayo, W. J.	Rochester	Shelden, C. H.	Rochester
Hench, P. S.	Rochester	Maytum, C. K.	Rochester	Sheldon, W. D.	Rochester
Henderson, M. S.	Rochester	McCarthy, W. C.	Rochester	Shoemaker, Rosemary	Rochester
Hendrick, J. A., Jr.	Rochester	McDonald, J. R.	Rochester	Sibley, W. L.	Rochester
Herrrell, W. E.	Rochester	McDonough, F. E.	Rochester	Sickler, J. R.	Rochester
Hertz, C. S.	Rochester	McKaig, C. B.	Pine Island	Simonton, K. M.	Rochester
Hewitt, E. S.	Rochester	McKinnon, D. A., Jr.	Rochester	Simpson, W. C.	Rochester
Hewitt, R. M.	Rochester	Mecray, P. M., Jr.	Rochester	Skaug, H. M.	Chatfield
Heyerdale, O. C.	Rochester	Merriit, W. A.	Rochester	Skinner, I. C., Jr.	Rochester
Heyerdale, W. W.	Rochester	Meyerding, H. W.	Rochester	Slocumb, C. H.	Rochester
Hildebrand, A. G.	Rochester	Middleton, A. W.	Rochester	Smith, B. F.	Rochester
Hines, E. A., Jr.	Rochester	Miller, J. M.	Rochester	Smith, C. H.	Rochester
Hinschaw, H. C.	Rochester	Moersch, F. P.	Rochester	Smith, F.	Rochester
Hodgson, C. H.	Rochester	Moersch, H. J.	Rochester	Smith, F. D.	Rochester
Hollister, C. B. H.	Rochester	Montgomery, Hamilton	Rochester	Smith, F. L.	Rochester
Holman, J. C., Jr.	Rochester	Montgomery, T. R.	Rochester	Smith, H. L.	Rochester
Horton, B. T.	Rochester	Morlock, C. G.	Rochester	Smith, L. A.	Rochester
Howell, L. P.	Rochester	Mousel, L. H.	Rochester	Smith, N. D.	Rochester
Hubly, J. W.	Rochester	Mulrooney, R. E.	Rochester	Snell, A. M.	Rochester
Hunt, A. B.	Rochester	Mundell, B. J.	Rochester	Snyder, J. M.	Rochester
Jackman, R. J.	Rochester	Mussey, R. D.	Rochester	Soniati, T. L.	Rochester
Jensen, M. P.	Rochester	Nash, L. A.	Rochester	Sprague, R. C.	Rochester
Jewett, R. E.	Rochester	Nass, H. A.	Mabel	Stalker, L. K.	Rochester
Johnson, H. P.	Harmony	Neal, H. B.	Rochester	Steenrod, E. J.	Rochester
Johnson, R. B.	Lanesboro	Nehring, J. P.	Preston	Steffens, L. F.	Rochester
Joyce, G. L.	Rochester	New, G. B.	Rochester	Stuhler, L. G.	Rochester
Judd, E. S., Jr.	Rochester	Norris, N. T.	Caledonia	Sutherland, C. G.	Rochester
Jump, W. C.	Kasson	Noth, P. H.	Rochester	Swartz, F. C.	Rochester
Kahler, J. E.	Rochester	Odel, H. M.	Rochester	Swift, E. V., Jr.	Rochester
Kearney, R. W.	Rochester	Olds, J. W.	Rochester	Swingle, H. F., Jr.	Rochester
Keith, N. M.	Rochester	O'Leary, P. A.	Rochester	Templin, D. B.	Gary, Indiana
Kelly, H. M.	Rochester	Olsen, A. M.	Rochester	Tennison, W. J., III.	Rochester
Kemble, J. W.	Plattsburg, N. Y.	Olson, E. J.	Pine Island	Thompson, K. J.	Rochester
Kendrick, T. D. H.	Rochester	Olson, G. E.	West Concord	Tierney, C. M.	Harmony
Kennedy, R. L. J.	Rochester	Onsgard, L. K., Jr.	Houston	Tillich, J. H.	Rochester
Kepler, E. J.	Rochester	Onsgard, L. K., Sr.	Houston	Trueman, K. R.	Rochester
Kermott, L. H., Jr.	Rochester	Parker, R. L.	Rochester	Tuohy, E. B.	Rochester
Kernohan, J. W.	Rochester	Parkhill, E. M.	Rochester	Vickers, P. M.	Rochester
Kerr, J. G.	Rochester	Patton, G. D.	Rochester	Wagner, H. P.	Rochester
Kierland, R. R.	Rochester	Paulson, D. L.	Rochester	Waisman, Morris	Rochester
Kirklin, B. R.	Rochester	Paulson, J. A.	Rochester	Wakefield, E. G.	Rochester
Kirklin, O. L.	Rochester	Pearman, R. O. D.	Rochester	Walsh, J. J.	Rochester
Koch, E. A. S.	Rochester	Pemberton, J. deJ.	Rochester	Walsh, M. N.	Rochester
Koch, F. L. P.	Rochester	Perozzi, Thelma	Rochester	Walters, Waltman	Rochester
Koelsche, G. A.	Rochester	Piper, M. C.	Rochester	Ward, C. E.	Rochester
Kowallis, G. F.	Rochester	Plummer, W. A.	Rochester	Washburn, R. N.	Rochester
Krusen, F. H.	Rochester	Pollock, L. W.	Rochester	Watkins, C. H.	Rochester
Kvale, W. F.	Rochester	Pool, T. L.	Rochester	Watterson, K. W.	Rochester
Laird, D. R.	Rochester	Popp, W. C.	Rochester	Waugh, J. M.	Rochester
Lanin, J. C.	Mabel	Powers, F. H.	Rochester	Weaver, D. F., Jr.	Rochester
Leddy, E. T.	Rochester	Prangen, A. D.	Rochester	Weber, H. M.	Rochester
Lemon, R. G.	Rochester	Prickman, L. E.	Rochester	Weir, J. F.	Rochester
Lemon, W. S.	Rochester	Priestley, J. T.	Rochester	Wilder, R. M.	Rochester
Lewis, E. B.	Rochester	Pumphrey, E.	Rochester	Williams, H. L., Jr.	Rochester
Lillie, H. I.	Rochester	Ralph, R. D.	Rochester	Williams, R. V.	Rushford
Lipscomb, W. R.	Rochester	Randall, L. M.	Rochester	Willius, F. A.	Rochester
Lloyd, S. J.	Rochester	Rasmussen, T. B.	Rochester	Wilson, L. B.	Rochester
Lochead, D. C.	Rochester	Regan, J. F.	Rochester	Wilson, R. B.	Rochester
Logan, A. H.	Rochester	Rhorer, R. J.	Rochester	Wilson, W. D.	Rochester
Logan, G. B.	Rochester	Risser, A. F.	Stewartville	Wolff, L. H.	Rochester
Lord, G. A.	Rochester	Rivers, A. B.	Rochester	Wolfgram, D. J.	Rochester
Love, J. W.	Rochester	Robertson, H. E.	Rochester	Woltman, H. W.	Rochester
Lovelace, W. R.	Rochester	Rogne, W. G.	Spring Grove	Wood, H. G.	Rochester
Lovelady, S. B.	Rochester	Rosenberg, E. F.	Rochester	Woodruff, C. W.	Chatfield
Luden, E. G.	Victoria, B. C., Can.	Rosenow, E. C., Jr.	Rochester	Woodruff, Robert	Rochester
Lundy, J. S.	Rochester	Rosenow, E. C.	Rochester	Worck, D. H.	Rochester
Macey, H. B.	Rochester	Rosenstiel, H. C.	Rochester	Yeager, C. L.	Rochester
MacKay, A. R.	Rochester	Rucker, C. W.	Rochester	Young, H. H.	Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail and Wilkin Counties

Regular meetings, Second Wednesday every even month

Annual meeting, December

Number of Members: 60

President		Baker, N. H.	Fergus Falls	Drought, W. W.	Fergus Falls
Combacker, L. C.		Bergquist, K. E.	Battle Lake	Erickson, C. O.	Fergus Falls
Secretary		Blakey, A. R.	Osakis	Esser, John	Perham
Boline, C. A.		Boline, C. A.	Battle Lake	Estrem, C. O.	Fergus Falls
Ahrens, R. S.		Boyd, L. M.	Alexandria	Gardner, W. P.	Fergus Falls
Arndt, H. W.		Boysen, J. E.	Pelican Rapids	Griswold, F. E.	Hoffman
Baker, A. C.		Boysen, Peter	Pelican Rapids	Hand, W. R.	Elbow Lake
May, 1938		Broker, W. S.	Variera	Hanson, E. C.	New York Mills
		Burnap, W. L.	Fergus Falls	Haskell, A. D.	Alexandria
		Clifford, G. W.	Osakis	Heiberg, E. A.	Fergus Falls
		Combacker, L. C.	Fergus Falls	Jacobs, G. C.	Fergus Falls

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

Johnson, O. V. Fergus Falls
Katzberg, L. W. Fergus Falls
Kierland, P. E. Alexandria
Lee, W. A. Fergus Falls
Leibold, H. H. Parkers Prairie
Leland, J. T. Herman
Lewis, A. J. Henning
Love, F. A. Carlos
Lund, C. J. T. Underwood
McMahon, L. H. Breckenridge
Miller, W. A. New York Mills
Mouritsen, G. J. Fergus Falls

Naegeli, Frank Fergus Falls
Nelson, W. I. Minneapolis
Nelson, W. O. B. Fergus Falls
Otto, H. C. Frazee
Parson, L. R. Elbow Lake
Patterson, W. L. Fergus Falls
Paulson, T. S. Fergus Falls
Powers, F. W. Barrett
Randall, A. M. Ashby
Reeve, E. T. Elbow Lake
Riley, J. B. Fergus Falls
Rimer, E. W. Breckenridge

Ross, W. P. Battle Lake
Satersmoen, Theodore Pelican Rapids
Sather, E. R. Alexandria
Serkland, J. C. Rothsay
Stemsrud, H. L. Parkers Prairie
Stuebe, H. W. Alexandria
Sutton, H. R. Hoffman
Tanquist, E. J. Alexandria
Vail, J. B. Henning
Windsor, R. L. Fergus Falls
Wray, W. E. Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday in every month excepting June, July, August
Annual meeting, last Monday in January
Number of Members: 336

President

Dunn, J. N. St. Paul

Secretary

Wilson, J. A. St. Paul

Abbott, J. S. St. Paul
Ahrens, A. E. St. Paul
Ahrens, A. H. St. Paul
Alberts, M. W. St. Paul
Alden, J. F. St. Paul
Alexander, F. H. St. Paul
Armstrong, J. M. St. Paul
Arquist, A. S. St. Paul
Aurelius, J. R. St. Paul
Ausman, C. F. St. Paul
Backus, A. S. St. Paul
Bacon, D. K. St. Paul
Bacon, L. C. St. Paul
Balcome, M. M. St. Paul
Barry, L. W. St. Paul
Barsness, Nellie St. Paul
Beadie, W. D. Cannon Falls
Beals, Hugh St. Paul
Beck, H. O. St. Paul
Bell, C. C. St. Paul
Beneppe, J. L. St. Paul
Bentley, P. H. St. Paul
Bentley, N. P. St. Paul
Berristord, P. D. St. Paul
Bicek, J. F. St. Paul
Binger, H. E. St. Paul
Birnberg, T. L. St. Paul
Bock, K. A. St. Paul
Boeckmann, Egil St. Paul
Bohland, E. H. St. Paul
Bolender, H. L. St. Paul
Borg, J. F. St. Paul
Bouna, L. P. St. Paul
Brand, G. D. St. Paul
Bray, E. R. St. Paul
Briggs, J. F. St. Paul
Broadie, T. E. St. Paul
Brodie, W. D. St. Paul
Brown, E. I. St. Paul
Brown, J. C. St. Paul
Bulinski, T. J. St. Paul
Burch, F. E. St. Paul
Burns, R. M. St. Paul
Burton, C. G. St. Paul
Bushner, H. H. St. Paul
Cain, C. L. St. Paul
Caldwell, J. P. St. Paul
Carroll, W. C. St. Paul
Chatterton, C. C. St. Paul
Christiansen, A. St. Paul
Christison, J. T. St. Paul
Clark, H. B., Jr. St. Paul
Clark, T. C. Minneapolis
Colby, Woodard St. Paul
Cole, W. H. St. Paul
Collie, H. G. St. Paul
Colvin, A. R. St. Paul
Connor, C. E. St. Paul
Cook, C. K. St. Paul
Countryman, R. S. St. Paul
Cowern, E. W. North St. Paul
Critchfield, L. R. St. Paul
Culligan, J. M. St. Paul
Dack, L. G. St. Paul
Daugherty, E. B. St. Paul
Daugherty, L. E. St. Paul
Davis, Herbert St. Paul
Davis, William St. Paul
Dedolph, Karl St. Paul
Delavan, P. A. St. Paul

Derauf, B. I. St. Paul
Dickson, T. H. St. Paul
Dittman, G. C. St. Paul
Donohue, P. F. St. Paul
Dovre, C. M. St. Paul
Drake, C. B. St. Paul
Dunn, J. N. St. Paul
Earl, G. A. St. Paul
Earl, John St. Paul
Earl, Robert St. Paul
Edlund, G. St. Paul
Edwards, J. W. St. Paul
Edwards, T. J. St. Paul
Ely, O. S. South St. Paul
Emerson, E. C. St. Paul
Endress, E. K. St. Paul
Ernest, G. C. South St. Paul
Eshelby, E. C. St. Paul
Fahey, E. W. St. Paul
Ferguson, J. C. St. Paul
Fessler, H. H. St. Paul
Flanagan, H. F. St. Paul
Fogarty, C. W. St. Paul
Fogelberg, E. J. St. Paul
Foley, F. E. B. St. Paul
Freeman, C. D. St. Paul
Fritz, W. L. St. Paul
Froats, C. W. St. Paul
Gager, E. C. St. Paul
Garbrecht, Arthur St. Paul
Gardiner, D. G. St. Paul
Geer, E. K. St. Paul
Gehlen, J. N. St. Paul
Geist, G. A. St. Paul
Ghent, C. H. St. Paul
Gibbs, E. C. St. Paul
Gilfillan, J. S. St. Paul
Ginsberg, Wm. St. Paul
Goltz, E. V. St. Paul
Grant, H. W. St. Paul
Gratzek, Thomas St. Paul
Graul, R. K. St. Paul
Greenberg, H. A. St. Paul
Gruenhagen, A. P. St. Paul
Hagaman, G. K. St. Paul
Hall, A. R. St. Paul
Hall, H. H. St. Paul
Hammes, E. M. St. Paul
Hammond, J. F. St. Paul
Harmon, G. E. St. Paul
Hartfel, W. F. St. Paul
Hartley, E. C. St. Paul
Hassett, M. F. St. Paul
Hauser, V. P. St. Paul
Hawkins, V. J. St. Paul
Heath, A. C. Stillwater
Heck, W. W. St. Paul
Hedenstrom, F. G. St. Paul
Hengstler, W. H. St. Paul
Hensel, C. N. St. Paul
Heron, R. C. St. Paul
Herrmann, E. T. St. Paul
Hilger, A. W. St. Paul
Hilger, D. D. St. Paul
Hilger, L. A. St. Paul
Hilleboe, H. E. St. Paul
Hiniker, L. P. St. Paul
Hochfäizer, J. J. St. Paul
Hoff, Alfred St. Paul
Hoffman, M. H. St. Paul
Holcomb, J. T. St. Paul
Holcomb, O. W. St. Paul
Holmen, R. W. St. Paul
Holt, J. E. St. Paul
Hopkins, G. W. St. Paul
Howard, M. A. St. Paul
Howard, W. S. St. Paul
Hullieck, R. B. St. Paul
Ide, A. W. St. Paul
Ikeda, Kano St. Paul
Ingerson, C. A. St. Paul

Jesion, J. W. St. Paul
Johanson, W. G. St. Paul
Johnson, A. M. St. Paul
Johnson, J. A. St. Paul
Johnson, R. G. St. Paul
Johnson, T. H. San Francisco, Calif.
Jones, E. M. St. Paul
Kamman, G. R. St. Paul
Kannary, E. L. St. Paul
Kaplan, D. H. St. Paul
Kasper, E. M. St. Paul
Keefe, Rolland St. Paul
Kelly, J. V. St. Paul
Kelly, P. H. St. Paul
Kenechick, E. V. St. Paul
Kennedy, W. A. St. Paul
Kesting, Herman St. Paul
King, L. St. Paul
Klein, H. N. St. Paul
Knauff, M. K. St. Paul
Kugler, A. A. St. Paul
Kvitrud, Gilbert St. Paul
Langenderfer, F. V. St. Paul
Larsen, C. L. St. Paul
Lax, M. H. St. Paul
Leahy, Bartholomew St. Paul
Leavenworth, R. O. St. Paul
Leitch, Archibald St. Paul
Leonard, G. J. Hastings
Lepak, J. A. St. Paul
Lerche, William Cable, Wis.
Leven, N. L. St. Paul
Levin, Bert St. Paul
Levitt, G. X. St. Paul
Lick, C. L. St. Paul
Lippman, H. S. St. Paul
Little, W. J. St. Paul
Livingstone, J. W. Hudson, Wis.
Lowe, E. R. South St. Paul
Lowe, T. A. South St. Paul
Lundholm, A. M. St. Paul
Lynch, F. W. St. Paul
Madden, J. F. St. Paul
Markoe, J. C. St. Paul
Martineau, J. L. St. Paul
McCarthy, J. J. St. Paul
McCarthy, W. R. St. Paul
McClanahan, J. H. White Bear
McClanahan, T. S. White Bear
McLaren, J. M. Minneapolis
McNevin, C. F. St. Paul
Meade, J. R. St. Paul
Mears, B. J. St. Paul
Medelman, J. P. St. Paul
Meyerding, E. A. St. Paul
Moga, J. A. St. Paul
Mogilner, S. N. St. Paul
Molander, H. A. St. Paul
Moquin, M. A. St. Paul
Moran, T. R. Phoenix, Ariz.
Moriarty, Berenice St. Paul
Morrisey, F. B. St. Paul
Mortenson, N. G. St. Paul
Moss, M. N. St. Paul
Moynihan, T. J. St. Paul
Muller, R. T. St. Paul
Myers, Thomas St. Paul
Naegeli, A. E. St. Paul
Naslund, A. W. St. Paul
Necher, F. H. St. Paul
Nelson, L. A. St. Paul
Nichols, A. E. St. Paul
Noble, J. F. St. Paul
Noble, J. L. St. Paul
Nye, K. A. St. Paul
Nye, L. L. St. Paul
O'Connor, L. J. St. Paul
Oerting, Harry St. Paul
Ogden, Warner St. Paul
Ohage, Justus, Jr. St. Paul
Olson, C. A. St. Paul
O'Reilly, B. E. St. Paul

*Deceased.

[illegible]

Schons, Edward	St. Paul
Schuld, F. C.	St. Paul
Schulze, A. G.	St. Paul
Schwytzer, Arnold	St. Paul
Scott, E. E.	St. Paul
Senkler, G. E.	St. Paul
Setzer, H. J.	St. Paul
Shannon, W. R.	St. Paul
Shellman, J. L.	St. Paul
Shillington, M. A.	St. Paul
Shimonek, S. W.	St. Paul
Shoeb, Jacob	St. Paul
Simons, L. T.	St. Paul
Singer, B. J.	St. Paul
Skinner, H. O.	St. Paul
Smisek, E. A.	St. Paul
Smith, V. D. E.	St. Paul
Snyder, G. W.	St. Paul
Sohlberg, O. I.	St. Paul
Souster, B. B.	St. Paul
Sprafka, J. M.	St. Paul
Steinberg, C. L.	St. Paul
Sterner, E. G.	St. Paul
Sterner, E. R.	White Bear
Stewart, Alexander	St. Paul
Stinnett, S. E.	St. Paul
Stoeckmann, A. E.	St. Paul
Stolpestad, A. H.	St. Paul
Stolpestad, H. L.	St. Paul
Strate, G. E.	St. Paul
Strauss, M. J.	St. Paul
Swanson, J. A.	St. Paul
Swendson, J. J.	St. Paul
Teisberg, C. B.	St. Paul

Thompson, F. A.	St. Paul
Thoreson, M. O.	St. Paul
Tift, E.	St. Paul
Tregilas, H. R.	South St. Paul
Van Slyke, C. A.	St. Paul
Veirs, Dean	St. Paul
Veirs, R. S.	St. Paul
Venables, A. E.	St. Paul
Von der Weyer, William	St. Paul
Waas, C. W.	St. Paul
Walker, A. E.	St. Paul
Wells, C. E.	St. Paul
Warnock, R. W.	St. Paul
Warren, C. A.	St. Paul
Warren, E. L.	St. Paul
Watz, C. E.	St. Paul
Webber, F. L.	St. Paul
Welch, M. C.	St. Paul
Werner, O. S.	Cambridge
Wheeler, M. W.	St. Paul
Whitacre, J. C.	St. Paul
Whitmore, Frank	St. Paul
Williams, J. A.	St. Paul
Williamson, G. A.	St. Paul
Wilson, J. A.	St. Paul
Wilson, J. V.	St. Paul
Winnick, J. B.	St. Paul
Wold, K. C.	St. Paul
Wolfe, H. H.	St. Paul
Wolff, H. J.	St. Paul
Wolkoff, H. J.	St. Paul
Youngren, E. R.	St. Paul
Zander, C. H.	St. Paul
Zimmermann, H. R.	St. Paul

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties

Annual meeting, second Tuesday, December

Number of Members: 59

Brown, I. L.	Crookston
Delmore, J. L., Jr.	Roseau
Delmore, J. L., Sr.	Roseau
Ederer, J. J.	Mahmomen
Erickson, Eskil.	Halstad
Griffin, P. J.	Fertile
Haugseth, Enoch	Twin Valley
Hedemark, H. H.	Thief River Falls
Helselt, H. K.	Thief River Falls
Hogdson, W. H.	Minish
Hodgson, H. H.	Crookston
Hollands, W. H.	Fisher
Holmstrom, C. H.	Warren
Johnson, H. C.	Thief River Falls
Kahala, Arthur	Crookston
Kirk, G. P.	East Grand Forks
Knutson, G. A.	Greenbush
Leitch, N. M.	Warroad
Loken, Theodore	Adrian
Lofgren, G. G.	Adrian
Melby, O. F.	Thief River Falls
Mercil, W. G.	Crookston

Morley, G. A.	Crookston
Nelson, H. E.	Crookston
Norman, J. F.	Crookston
Ohnstad, J. L.	McIntosh
Oppeggaard, C. L.	Crookston
Oppeggaard, M. O.	Crookston
Paradis, W. G.	Crookston
Parsons, J. G.	Crookston
Fellettiere, E. V.	Thief River Falls
Reif, A. R.	Crookston
Rice, H. R.	Crookston
Roy, J. A.	Red Lake Falls
Sather, R. O.	Crookston
Shaleen, A. W.	Hallock
Shedlov, Abraham.	Foston
Stevens, John.	Gonvick
Stocking, F. F.	Hallock
Stuermanns, S. H.	Ersikine
Tauglin, W. G. L.	Mahommed
Thompson, W. B.	Ookie
Wiley, C. G.	Crookston
Whitgrut, I. G.	Quin

Regular meetings, May, August, November, and February

Annual meeting, May

Number of Members: 31

Dysterheft, A. F.	Gaylord
Esser, O. J.	Gibbon
Feszenmaier, O. B.	New Ulm
Fritsche, Albert.	New Ulm
Fritsche, C. J.	New Ulm
Fritsche, T. R.	New Ulm
Gibbons, F. C.	Comfrey
Goblirsch, A. P.	Sleepy Eye
Hammermeister, T. F.	New Ulm
Hovde, Rolf.	Winthrop
Kusske, A. L.	New Ulm
Mortsensback, H. E.	Hanska

Nuessle, W. G.	Springfield
Olson, K. L.	Gibson
Peterson, R. A.	Vesta
Reineke, G. F.	New Ulm
Rothenburg, J. C.	Springfield
Saffert, C. A.	New Ulm
Schroepel, J. E.	Winthrop
Seifert, O. J.	New Ulm
Vogel, H. A. L.	New Ulm
Vogel, J. H.	New Ulm
Wahlberg, E. W.	Morgan
Weiser, G. B.	New Ulm
Wohlrahe, E. J.	Springfield

Regular meeting, second Tuesday of each month

Annual meeting, November

Number of Members: 22

Brand, W. A.	Redwood Falls
Bushard, W. J.	Bird Island
Cole, H. B.	Redwood Falls
Cole, J. G.	Redwood Falls
Cosgriff, J. A.	Olivia
Dordal, J.	Sacred Heart
Fawcett, A. M.	Renville
Flinn, T. E.	Redwood Falls
Gaines, E. C.	Buffalo Lake
Hartmann, C. M.	Fairfax

Johnson, O. H.....	Redwood Falls
Lenz, J. R.....	Morton
Loenholdt, E. H.....	Hector
Madland, R. S.....	Fairfax
Mesker, G. H.....	Olivia
Passer, A. A.....	Olivia
Penhall, F. W.....	Morton
Potthoff, C. J.....	Morgan
Preisinger, J. W.....	Renville
Solsen, F. N.....	Sacred Heart

*Deceased.

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

RICE COUNTY MEDICAL SOCIETY

Regular meetings, at call

Annual meeting, December

Number of Members: 36

President	
Huxley, F. R.	Faribault
Secretary	
Plonske, C. J.	Faribault
Babcock, F. M.	Northfield
Beede, E. R.	Faribault
Dugan, L. F.	Faribault
Dungay, N. S.	Northfield
Engberg, E. J.	Faribault
Francis, D. W.	Morristown
Haessly, S. B.	Faribault

Hanson, A. M.	Faribault
Haynes, A. L.	Faribault
Huxley, F. R.	Faribault
Kanne, C. W.	Faribault
Kucera, S. T.	Lonsdale
Lende, Norman	Faribault
Lexa, F. J.	Lonsdale
Lufkin, C. D.	Northfield
Lyght, C. E.	Northfield
McKeon, J. O.	Montgomery
Meyer, F. C.	Kenyon
Meyer, F. F.	Faribault
Moses, Joseph, Jr.	Northfield
Moses, R. R.	Kenyon
Nuetzman, A. W.	Faribault

Plonske, C. J.	Faribault
Robilliard, C. M.	Faribault
Rohrer, C. A.	Waterville
Rudie, C. N.	Kenyon
Rumpf, C. W.	Faribault
Rumpf, W. H.	Faribault
Stewart, Gwendolyn	Faribault
Stroebel, C. F.	Northfield
Thorson, O. P.	Northfield
Traeger, C. A.	Northfield
Warren, F. S.	Washington, D.C.
Wilkowski, R. J.	Neerstrand
Wilson, Warren	Northfield
Wylie, A. R. T.	Fairbault

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties

Regular meetings, second Thursday every month

Annual meeting, December

Number of Members: 215

President	
Gillespie, M. G.	Duluth
Secretary	
MacRae, G. C.	Duluth
Adams, B. S.	Hibbing
Addy, E. R.	Gilbert
Akins, W. M.	Eveleth
Anderson, H. R.	Deer River
Armstrong, A. G.	Duluth
Athens, A. E.	Duluth
Ayres, G. T.	Ely
Bachnik, F. W.	Hibbing
Bagley, E. C.	Duluth
Bagley, W. R.	Duluth
Bakkila, Henry	Duluth
Bardon, Richard	Duluth
Barney, L. A.	Duluth
Berdez, G. L.	Duluth
Bianco, A. J.	Duluth
Binet, H. E.	Grand Rapids
Birkland, O. N.	Hibbing
Blacklock, S. S.	Hibbing
Blakely, C. C.	Barnum
Boman, P. G.	Duluth
Bowen, R. L.	Hibbing
Boyer, S. H., Jr.	Duluth
Boyer, S. H., Sr.	Duluth
Braverman, N. J.	Duluth
Bray, P. N.	Duluth
Bray, R. B.	Biwabik
Buckley, R. P.	Duluth
Burton, J. L.	Buhl
Cantwell, W. F.	International Falls
Carstens, C. F.	Hibbing
Chapman, T. L.	Duluth
Cheney, E. L.	Duluth
Chermak, F. G.	Duluth
Chessen, James	Duluth
Christensen, E. P.	Two Harbors
Clark, F. F.	Duluth
Clement, T. G.	Duluth
Collins, A. N.	Duluth
Collins, H. C.	Duluth
Coventry, W. A.	Duluth
Coventry, W. D.	Duluth
Dahlin, I. T.	Aurora
Davis, B. F.	Duluth
Doolittle, L. E.	Duluth
Doyle, G. C.	Duluth
Eckman, P. F.	Duluth
Eckman, R. J.	Duluth
Ekblad, J. W.	Duluth
Elias, F. J.	Duluth
Emanuel, K. W.	Duluth
Eppdahl, F. W.	Grand Rapids
Eppard, R. M.	Cloquet
Estrem, T. A.	Hibbing
Ewens, H. B.	Virginia
Fankboner, A. V.	Buhl
Fawcett, K. R.	Duluth
Fellows, M. F.	Duluth
Fetterly, Warren	Virginia
Feuling, J. C.	Bovey
Fischer, M. McC.	Duluth
Fisher, Isadore	Ceylon
Forbes, R. S.	Duluth
Gendron, J. F.	Grand Rapids
Gillespie, M. G.	Duluth
Gillespie, N. H.	Duluth
Goldish, D. R.	Duluth
Goodman, C. E.	Virginia

Gowan, L. R.	Duluth
Graham, Robert	Duluth
Graves, W. N.	Duluth
Hall, A. E.	Virginia
Haney, C. L.	Duluth
Hanson, E. O.	Cloquet
Harlowe, H. D.	Virginia
Harris, C. N.	Hibbing
Hatch, W. E.	Duluth
Hathaway, S. J.	Proctor
Hayes, M. F.	Nashauk
Hedberg, G. A.	Nomeping
Heiam, W. C.	Cook
Heimark, O. E.	Duluth
Hilding, A. C.	Duluth
Hill, F. E.	Duluth
Hirschboeck, F. J.	Duluth
Hirschfeld, M. S.	Duluth
Hoff, H. O.	Duluth
Hursh, M. M.	Cohasset
Jacobson, Clarence	Chisholm
Jensen, T. J.	Duluth
Johnson, D. E.	Duluth
Jolin, F. M.	Grand Rapids
Jolin, R. V.	Grand Rapids
Junnila, B. O.	Grand Rapids
Keyes, C. R.	Duluth
Kiesling, I. H.	Nashauk
Klein, Harry	Duluth
Knapp, F. N.	Duluth
Kohlby, C. O.	Duluth
Kotchevar, F. R.	Eveleth
Kraft, Peter	Duluth
Krantz, C. L.	Duluth
Kuth, J. R.	Duluth
Laird, A. T.	Nomeping
Lenont, C. B.	Virginia
Lepak, F. J.	Duluth
Litman, S. N.	Duluth
Loofbourrow, E. H.	Keewatin
Lundquist, C. W.	Hibbing
Macfarlane, P. H.	Chisholm
MacRae, G. C.	Duluth
Magney, F. H.	Duluth
Malmstrom, J. A.	Virginia
Manley, J. R.	Duluth
Marley, W. J.	Nomeping
Martin, E. T.	Duluth
Martin, W. C.	Duluth
Mattson, C. H.	Duluth
Mayne, R. M.	Duluth
McCarty, P. D.	Ely
McComb, C. F.	Duluth
McCoy, M. K.	Duluth
McDaniel, S. P.	Virginia
McDonald, A. L.	Duluth
McHaffie, C. I.	Duluth
McKenna, M. J.	Grand Rapids
McLeod, J. L.	Grand Rapids
McNutt, J. R.	Duluth
Mead, C. H.	Duluth
Merriman, L. L.	Duluth
Miners, G. A.	Deer River
Mithy, I. L.	Hibbing
Moe, R. J.	Duluth
Moe, Thomas	Moose Lake
Monroe, P. B.	Two Harbors
More, C. W.	Eveleth
Morsman, L. W.	Hibbing
*Moss, C. R.	Zumbrota
Mueller, S. C.	Duluth
Nelson, E. H.	Chisholm
Nelson, R. L.	Duluth
Nicholson, M. A.	Duluth

Nutting, R. E.	Duluth
O'Hanlon, J. A.	Proctor
Olson, A. E.	Duluth
Olson, A. O.	Duluth
Palmer, H. A.	Eveleth
Parker, D. M.	Oakland, Calif.
Parker, O. W.	Ely
Pasek, A. W.	Cloquet
Pearsall, R. P.	Virginia
Pennie, D. F.	Duluth
Peterson, E. N.	Virginia
Peterson, J. H.	Duluth
Plowman, E. T.	Marble
Power, J. E.	Duluth
Puumala, R. H.	Cloquet
Raadquist, C. S.	Hibbing
Raihala, John	Virginia
Raiter, F. W. S.	Cloquet
Raiter, R. F.	Cloquet
Richardson, F. L.	Coleraine
Robinson, J. M.	Duluth
Rokala, H. E.	Biwabik
Rood, D. C.	Duluth
Rowe, O. W.	Duluth
Rowles, E. K.	Coleraine
Rudie, P. S.	Duluth
Ryan, W. J.	Duluth
Sach-Rowitz, Alvin	Moose Lake
Salter, R. A.	Virginia
Sarff, O. E.	Virginia
Sax, S. G.	Duluth
Scherer, C. A.	Duluth
Schroder, C. H.	Duluth
Schweiger, T. R.	Hibbing
Seashore, R. T.	Duluth
Shapiro, E. Z.	Duluth
Shastid, T. H.	Duluth
Shaw, A. W.	Buhl
Sinamark, Andrew	Hibbing
Sisler, C. E.	Grand Rapids
Slyfield, F. F.	Duluth
Smith, C. M.	Duluth
Smith, S. J.	Eveleth
Smith, W. R.	Grand Marais
Span, A. J.	Duluth
Spicer, F. W.	Duluth
Spurbeck, R. G.	Cloquet
Strathern, M. L.	Gilbert
Strobel, W. G.	Duluth
Stuart, A. B.	Cloquet
Sukeforth, L. A.	Duluth
Sutherland, H. N.	Ely
Swanson, P. E.	Virginia
Swenson, A. O.	Duluth
Taylor, C. W.	Duluth
Tibbetts, M. H.	Duluth
Tilderquist, D. L.	Duluth
Tuohy, E. L.	Duluth
Urborg, S. E.	Duluth
Van Valkenberg, J. D.	Floodwood
Vercellini, C. E.	Duluth
Walker, A. E.	Duluth
Wallace, M. O.	Duluth
Watson, C. G.	Soudan
Webber, E. E.	Duluth
Wells, A. H.	Duluth
West, E. J.	Faribault
Wheeler, D. W.	Duluth
Wilkinson, S. L.	Duluth
Wingquist, C. G.	Los Angeles, Calif.
Winter, J. A.	Duluth
Young, T. O.	Duluth
Young, V. A.	Duluth
Zlatovski, M. L.	Duluth

*Deceased.

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of the month

Annual meeting, June

Number of Members: 33

President
Cervenka, C. F. New Prague

Secretary
Pearson, B. F. Shakopee

Buck, F. H. Shakopee
Butler, J. K. Carlton
Cervenka, C. F. New Prague
Crow, E. R. Arlington
Dowdlat, R. W. Cologne
Eklund, E. J. Norwood
Emmerson, W. S. Mayer

Fischer, H. P. Shakopee
Havel, H. W. Jordan
Hebeisen, M. B. Chaska
Henriksen, H. G. Elko
Juergens, H. M. Belle Plaine
Klein, J. C. Shakopee
Kortsch, F. P. Prior Lake
Maertz, W. F. New Prague
Malerich, J. A. Shakopee
Martin, T. P. Arlington
Nagel, H. D. Waconia
Novak, E. E. New Prague
Olson, C. J. Belle Plaine

Ormond, D. T. Waconia
Pearson, B. F. Shakopee
Phillips, W. H. Jordan
Pogue, R. E. Glendale, Calif.
Reiter, H. W. Shakopee
Rick, P. F. W. Le Center
Schimelpfenig, G. T. Chaska
Shrader, J. S. Jordan
Simons, B. H. Chaska
Westerman, A. E. Montgomery
Westerman, F. C. Montgomery
Woodworth, L. F. Le Center
Wunder, H. E. Shakopee

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone and Rock Counties

Regular meetings, November and April or May

Annual meeting, November

Number of Members: 62

President
Sherman, C. L. Luverne

Secretary
DeBoer, Hermanus. Edgerton

Arnold, E. W. Adrian
Basinger, H. P. Windom
Basinger, H. R. Mountain Lake
Beckerling, Gerrit. Edgerton
Benjamin, W. G. Pipestone
Bolenkamp, F. W. Luverne
Brown, A. H. Pipestone
Carlson, J. V. Westbrook
Chadbourne, A. G. Heron Lake
Chunn, S. S. Pipestone
Clark, H. H. Edgerton
Cress, P. J. Ellsworth
DeBoer, Hermanus. Edgerton
Dolan, C. P. Worthington
Doman, V. W. Lakefield
Doms, H. C. Slayton
Engb, Sigfred. Jackson

Halloran, W. H. Jackson
Halpern, D. J. Brewster
Harrison, P. W. Worthington
Hebbel, Robert. Windom
Hitchings, W. S. Lakefield
Johnson, R. E. Worthington
Kelling, L. F. Lakefield
Kendahl, A. M. Jasper
Kilbride, E. A. Worthington
Kilbride, J. S. Worthington
Lohmann, J. G. Jasper
Lowe, Thomas. Pipestone
Maitland, D. P. Jackson
Maitland, E. T. Jackson
Manson, F. M. Worthington
McCre, J. M. Fulda
McElmeel, E. F. Pipestone
McLane, E. G. Jackson
McLane, W. O. Jackson
Mork, B. O., Jr. Worthington
Mork, B. O., Sr. Worthington
Nealy, D. E. Adrian
Pankratz, P. J. Mountain Lake

Patterson, W. E. Westbrook
Piper, W. A. Mountain Lake
Priest, R. E. Worthington
Rose, J. T. Lakefield
Schade, F. L. Worthington
Schutz, E. S. Mountain Lake
Sether, A. F. Ruthton
Sherman, C. L. Luverne
Sjostrom, L. E. Storden
Slater, S. A. Worthington
Sogge, L. L. Windom
Stanley, C. R. Worthington
Stevenson, B. M. Fulda
Stratte, H. C. Windom
Thorson, E. O. Luverne
Tofte, Josephine. Minneapolis
Waller, J. D. Wilmont
Wells, W. B. Jackson
Williams, A. B. St. Paul
Williams, C. A. Pipestone
Williams, L. A. Slayton
Wright, C. O. Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday of the month

Annual meeting, third Thursday of December

Number of Members: 52

President
Clark, H. B. St. Cloud

Secretary
Libert, J. N. St. Cloud

Adams, L. P. St. Cloud
Barringer, P. E. St. Cloud
Beuning, J. B. Albany
Brigham, C. F. St. Cloud
Buscher, J. C. St. Cloud
Clark, H. B. St. Cloud
Donaldson, C. S. Foley
DuBois, J. F. Sauk Center
Engstrom, G. F. Belgrade
Evans, L. M. Sauk Rapids
Fleming, T. N. St. Cloud
Freeman, W. L. St. Cloud
Friesleben, William. Sauk Rapids
Gaida, J. B. St. Cloud

Goehrs, H. W. St. Cloud
Haberman, Emil. Osakis
Halenbeck, P. L. St. Cloud
Hemstead, Werner. Brainerd
Henry, C. J. Milaca
Holdridge, George. Foley
Johnson, Walfred. Sauk Center
Jones, R. N. St. Cloud
Kern, M. J. St. Cloud
Kettlewell, R. B. Sauk Center
Kingsbury, E. M. Clearwater
Kohler, D. W. St. Joseph
Koop, H. E. Cold Spring
Koop, S. H. Richmond
Lewis, C. B. St. Cloud
Libert, J. N. St. Cloud
Mahowald, A. Albany
McDowell, J. P. St. Cloud
Meyer, A. A. Melrose

Moynihan, A. F. Sauk Center
Myre, C. R. Paynesville
Rathbun, C. A. St. Cloud
Richards, W. B. St. Cloud
Rumpf, W. H. St. Cloud
Sandven, N. O. Paynesville
Schatz, F. J. St. Cloud
Sher, D. A. Cold Spring
Sherwood, G. E. Kimball
Stangl, Fred. St. Cloud
Stangl, P. E. St. Cloud
Stewart, N. E. St. Cloud
Sutton, C. S. St. Cloud
Townsend, De Wayne. Broton
Walfred, K. A. St. Cloud
Watson, W. J. Holdingford
Wenner, W. T. St. Cloud
Wiechman, F. H. St. Cloud
Zachman, A. H. Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, second Monday of month

Annual meeting, January

Number of Members: 18

President
Schaefer, J. F. Owatonna

Secretary
McEnaney, C. T. Owatonna

Berghs, L. V. Owatonna

Carlson, V. W. Blooming Prairie
Dewey, D. H. Owatonna
Ertel, E. Q. Ellendale
Farabaugh, C. L. Owatonna
Flores, O. T. Dodge Center
Hartung, E. H. Claremont
Kreuzer, T. C. Owatonna
McEnaney, C. T. Owatonna

McIntyre, J. A. Owatonna
Melby, Benedik. Blooming Prairie
Morehead, D. E. Owatonna
Nelson, E. J. Owatonna
Roberts, O. W. Owatonna
Schaefer, J. F. Owatonna
Senn, E. W. Owatonna
Smersh, J. F. Owatonna
Stewart, A. B. Owatonna

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Lake of the Woods, Morrison,
Todd and Wadena Counties
Regular meetings, quarterly
Annual meeting, January
Number of Members: 95

President
Lamb, H. L. Little Falls

Secretary
Badeaux, G. I. Brainerd

Amundson, A. E. Little Falls
Anderson, C. E. Brainerd
Badeaux, G. I. Brainerd
Beise, R. A. Brainerd
Benton, P. C. Staples
Borgerson, A. H. Sebeka
Bosland, H. G. Verndale
Bray, K. E. Park Rapids
Burns, H. A. Ah-Gwah-Ching
Campbell, R. W. Cass Lake
Cardle, G. E. Ah-Gwah-Ching
Carlson, C. E. Aitkin
Carlson, H. A. Walker
Christie, G. R. Long Prairie
Christie, R. L. Long Prairie
Cook, J. M. Staples
Davis, L. T. Wadena
Davis, R. D. Clearbrook
Davis, T. C. Wadena
Dworak, A. F. Walker
Eiler, John. Park Rapids
Ericsson, M. G. Long Prairie
Fait, R. V. Little Falls
Frost, H. T. Wadena
Garlock, A. V. Bemidji
Garlock, D. H. Bemidji
Gerber, M. P. Brainerd
Ghostley, M. C. Puposky

Gifford, B. L. Long Prairie
Gorenflo, Leila. Cass Lake
Grawn, F. A. Northome
Grogan, J. S. Wadena
Groschupf, T. P. Bemidji
Grose, F. N. Clarissa
Hanover, R. D. Littlefork
Hanson, E. C. Park Rapids
Hawkinson, J. P. Crosby
Hawkinson, L. F. Brainerd
Healy, R. T. Pierz
Hendrickson, R. R. Wadena
Hesselgrave, S. S. St. Paul
Higgs, W. W. Park Rapids
Holst, C. F. Little Falls
Holst, J. B. Little Falls
House, Z. E. Cass Lake
Houston, D. M. Park Rapids
Hubbard, O. E. Brainerd
Hubin, E. G. Deerwood
Jacobson, D. J. Blackduck
Jamieson, E. F. Brainerd
Johnson, C. E. Pine River
Johnson, D. L. Little Falls
Johnson, E. W. Bemidji
Kelly, B. W. Aitkin
Kerlan, Irvin. Minneapolis
Kerlan, S. Z. Aitkin
Lamb, H. L. Little Falls
Lee, H. W. Brainerd
Lenarz, A. J. Browerville
Lund, W. J. Staples
Marcum, E. H. Bemidji
Mark, Hilbert. Minneapolis

Mason, J. A. International Falls
McCann, D. F. Bemidji
Mosby, M. E. Long Prairie
Moyer, R. E. Minneapolis
Mulligan, A. M. Brainerd
Nelson, N. P. Brainerd
Petraborg, H. T. Aitkin
Pierce, C. H. Wadena
Potek, David. International Falls
Quanstrom, V. E. Brainerd
Ratcliffe, J. J. Aitkin
Reichelderfer, C. F. Staples
Ringle, O. F. Walker
Roberts, L. M. Little Falls
Rosenfield, A. B. Pequot
Shannon, S. S. Crosby
Simons, E. J. Swanville
Smith, B. A. Akeley
Stafford, C. E. Crosby
Stein, R. J. Hewitt
Swedenburg, P. A. Swanville
Thabes, J. A., Jr. Brainerd
Thabes, J. A., Sr. Brainerd
Vandersluis, C. W. Bemidji
Watson, A. M. Royalton
Watson, J. D. Holdingford
Watson, P. T. Cass Lake
Webster, L. J. Ah-Gwah-Ching
Whittemore, D. D. Bemidji
Will, W. W. Bertha
Wilson, V. O. Minneapolis
Withrow, M. E. International Falls

WABASHA COUNTY MEDICAL SOCIETY

Regular meetings, March, October
Annual meeting, first Thursday after first Monday in October
Number of Members: 14

President
Sherman, H. T. Plainview

Secretary
Wilson, W. F. Lake City
Bayley, E. C. Lake City
Bouquet, B. J. Wabasha

Burlingame, D. A. Mazeppa
Cochrane, W. J. Lake City
Collins, J. S. Wabasha
Ellis, E. W. Elgin
Flesche, B. A. Lak City
Frost, R. H. Wabasha

Holt, G. W. Wabasha
Mahl, D. G. Plainview
Ochsner, C. G. Wabasha
Sherman, H. T. Plainview
Slocumb, J. A. Plainview
Wilson, W. F. Lake City

WASECA COUNTY MEDICAL SOCIETY

Regular meetings, at call
Annual meeting, December
Number of Members: 9

President
McIntire, H. M. Waseca

Secretary
Olds, G. H. Waseca

Bernstein, W. C. New Richland
Chadbourne, C. R. Janesville
Erickson, R. E. New Richland
Gallagher, B. J. Waseca
Hottinger, R. C. Janesville

McIntire, H. M. Waseca
Oeljen, S. C. Waseca
Olds, G. H. Waseca
Swenson, O. J. Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, February, March, April, May, September, October,
November and December
Annual meeting second Tuesday in December
Number of Members: 16

President
Ewald, R. P. Newport

Secretary
Boleyn, E. S. Stillwater
Boleyn, E. S. Stillwater
Brooks, G. F. Stillwater

Ewald, R. P. Newport
Haines, J. H. Stillwater
Humphrey, W. R. Stillwater
Josewski, R. J. Stillwater
Kalinoff, D. Stillwater
Linner, Gunnar. Stillwater
McCarten, F. M. Stillwater

Mingo, F. E. Hugo
Poirier, J. A. Forest Lake
Ruggles, G. McC. Forest Lake
Samson, E. R. Stillwater
Strand, E. V. Bayport
Stuhr, J. W. Stillwater
Van Meier, Henry. Stillwater

WATONWAN COUNTY MEDICAL SOCIETY

Regular meeting, at call
Annual meeting, December
Number of Members: 8

President
Bratrude, E. J. St. James

Secretary
Grimes, H. B. Madelia

Bergman, O. B. St. James
Bratrude, E. J. St. James
Bregel, F. L. St. James
Grimes, H. B. Madelia

Hagen, O. E. Butterfield
Hammar, L. M. Butterfield
McCarthy, W. J. Madelia
Thompson, Albert. St. James

ROSTER MINNESOTA STATE MEDICAL ASSOCIATION

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties

Regular meetings, second Wednesday in January, April, July and October

Annual meeting, second Wednesday in October

Number of Members: 23

Shelver, H. J. President
Ortonville
Oliver, I. L. Secretary
Graceville
Arneson, A. L. Morris
Bates, B. V. Browns Valley
Behmler, F. W. Morris
Bergan, Otto. Clinton
Bolsta, Charles. Ortonville

Caine, C. E. Morris
Cumming, J. F. Morris
Doleman, N. F. Tintah
Eberlin, E. A. Glenwood
Else, E. McC. Glenwood
Else, J. R. Glenwood
Ewing, C. F. Wheaton
Fitzgerald, E. T. Morris
Garrow, D. M. St. Paul
Giesen, A. F. Starbuck

Karn, B. R. Ortonville
Lindberg, A. L. Wheaton
Linde, Herman. Cyrus
McIver, B. A. Lowry
Mooney, L. P. Graceville
O'Donnell, D. M. Ortonville
Oliver, C. I. Graceville
Oliver, I. L. Graceville
Ransom, M. L. Hancock
Shelver, H. J. Ortonville

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July, October

Annual meeting, first Monday in January

Number of Members: 25

Tweedy, R. B. President
Winona
Steiner, I. W. Secretary
Winona
Benoit, F. T. Winona
Christensen, E. E. Winona
Heise, W. F. C. Winona
Keyes, J. D. Winona

Lindsay, W. V. Winona
Mattison, F. A. Winona
McLaughlin, E. M. Winona
Meinert, A. E. Winona
Nauth, W. W. Winona
Neumann, C. A. Winona
Nilles, L. J. Rollingstone
Page, R. L. St. Charles
Risser, E. D. Winona
Robbins, C. P. Winona
Roemer, H. J. Winona

Roth, F. D. Lewiston
Satterlee, H. W. Lewiston
Schaefer, Samuel. Winona
Steiner, I. W. Winona
Tweedy, G. J. Winona
Tweedy, R. B. Winona
Walker, G. H. Winona
Whetstone, S. D. Winona
Wilson, R. H. Winona
Younger, L. I. Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly

Annual meeting, first Wednesday after first Monday in October

Number of Members: 18

Grundset, O. J. President
Montrose
Catlin, J. J. Secretary
Buffalo
Anderson, W. P. Buffalo
Bendix, L. H. Annandale

Catlin, J. J. Buffalo
Catlin, T. J. Buffalo
Ellison, F. E. Monticello
Greenfield, W. T. Delano
Grundset, O. J. Montrose
Harriman, L. Howard Lake
Hart, W. E. Monticello
Hoyer, L. J. Howard Lake

Lee, J. L. Watertown
Peterson, O. L. Cokato
Phillips, A. E. Delano
Ridgway, A. M. Annandale
Roholt, C. L. Waverly
Rousseau, Victor. Maple Lake
Thielen, R. D. St. Michael
Thompson, Arthur. Cokato

Brensting,
Brusegard,
Brusch, G.
Bryant, F.
Bryant, O
Buchstein,
Buck, F.
Buckle, J.
Buie, L.,
Bulinaki,
Bulkley, I.
Ballard, R.
Burck, F.
Burchell,
Burlington,
Burnap, A.
Burns, V.
Burns, H.
Burns, H.
Burns, H.
Burns, M. R.
Borton, C.
Burton,
Buscher,
Bushard,
Bushier,
Bussey,
Butler,
Butt, T. H.
Butterff,
Butzer,
Buzzeile

Cabell,
Cable,
Cabot,
Cabot,
Cadby,
Cady,
Cain,
Caine,
Cafrins,
Calhoue,
Callahan,
Callers,
Cammerer,
Camera,
Camp,
Camp,
Campbell,
Campbell,
Campbell,
Canferre,
Canwell,
Cardle,
Carde,
Carey,
Carlala,
Carlos,
Carlos,
Carlos,
Carlos,
Caro,
Carr,
Cars,
Catll,
Cattall,
Cerv,
Chae,
Chaad,
Chaa,
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Bair, H. L.	Spokane, Wash.
Bair, R. J.	Rochester
Baken, M. C.	Minneapolis
Baker, A. P.	Fergus Falls
Baker, A. T.	Minneapolis
Baker, E. L.	Minneapolis
Baker, G. S.	Rochester
Baker, H. R.	Hayfield
Baker, H. S.	Minneapolis
Baker, N. H.	Fergus Falls
Baker, R. L.	Hayfield
Bakkila, Henry	Duluth
Balcome, M. M.	St. Paul
Halfour, D. C.	Rochester
Bannick, E. G.	Seattle, Wash.
Barber, J. P.	Minneapolis
Bardon, Richard	Duluth
Barksdale, H.	Rochester
Barker, N. W.	Rochester
Barnes, A. R.	Rochester
Barney, L. A.	Duluth
Barr, L. C.	Albert Lea
Barr, W. H.	Wells
Barringer, P. E.	St. Cloud
Barron, Moses	Minneapolis
Barry, L. W.	St. Paul
Barsness, Nelson	St. Paul
Barings, H. P.	Windom
Basinger, H. R.	Mountain Lake
Bass, G. W.	Minneapolis
Bates, B. V.	Browns Valley
Baxter, S. H.	Minneapolis
Bayard, H. F.	Minneapolis
Bayley, E. C.	Lake City
Beadle, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Beck, L. H.	Minneapolis
Becking, Gerrit	Edgerton
Beckman, W. G.	Minneapolis
Bedard, R. E.	Rochester
Bedford, E. W.	Minneapolis
Beede, E. R.	Faribault
Beek, H. O.	St. Paul
Behmher, F. W.	Morris
Behr, O. R.	Crookston
Beise, R. A.	Brainerd
Beisinger, R. H.	Wykoff
Beizer, L. H.	Rochester
Bell, C. C.	St. Paul
Bell, E. T.	Minneapolis
Belote, G. B.	Caledonia
Belzer, M. S.	Minneapolis
Bendix, L. H.	Annapdale
Benedict, W. L.	Rochester
Benepje, J. L.	St. Paul
Bene, E. W.	Stankato
Benjamin, A. E.	Minneapolis
Benjamin, E. G.	Minneapolis
Benjamin, H. G.	Minneapolis
Benjamin, W. G.	Pipestone
Benn, F. G.	Minneapolis
Bennett, R. L., Jr.	Rochester
Bennion, P. H.	St. Paul
Benoit, F. T.	Winona
Benson, K. F.	Rochester
Bentley, P. P.	St. Paul
Benton, P. C.	Staples
Berdez, G. L.	Duluth
Bergan, Otto	Clinton
Berge, D. O.	Roseau
Berger, A. G.	Minneapolis
Bergh, G. S.	Minneapolis
Bergh, L. N.	Montevideo
Bergheim, M. C.	Honey
Bergins, O. B.	Ontonagon
Bergman, O. B.	St. James
Bergquist, K. E.	Battle Lake
Berkman, D. M.	Rochester
Berkman, J. M.	Rochester
Berkwitz, N. J.	Minneapolis
Berlin, A. S.	Hallock
Berman, Reuben	Minneapolis
Bernstein, W. C.	New Richmond
Bernstorf, P. L.	St. Paul
Berns, C. L.	Crookston
Bessen, A. N., Jr.	Minneapolis
Bessen, W. A.	Minneapolis
Betlach, C. J.	Rochester
Beuning, J. B.	Albany
Bianco, A. J.	Duluth
Biecek, J. F.	St. Paul
Biedermann, Jacob	Thief River Falls
Bigelow, C. E.	Dodge Center
Biggs, R. E.	Franklin
Binet, H. E.	Grand Rapids
Binger, H. E.	St. Paul
Binger, M. W.	Rochester
Birge, H. L.	Rochester

Birkland, O. N.	.....	Hibbing
Birring, T. L.	.....	St. Paul
Black, B. M.	.....	Rochester
Black, J. R.	.....	Rochester
Black, William	.....	Manakato
Blacklock, S. S.	.....	Hibbing
Blake, James	.....	Hopkins
Blake, F. A.	.....	Hopkins
Blake, F. W.	.....	Seattle
Blakely, C. C.	.....	Barnum
Blakey, A. R.	.....	Osakis
Blanchard, H. G.	.....	Fairmont
Blaustone, H. H.	.....	Minneapolis
Blegen, H. M.	.....	Warren
Blodel, T. J. G.	.....	Minneapolis
Bloomburg, W. R.	.....	Princeton
Blum, H. R.	.....	Rochester
Blumenthal, J. S.	.....	Columbia Heights
Boardman, D. V.	.....	Twin Valley
Hock, R. A.	.....	St. Paul
Bockman, M. W. H.	.....	Minneapolis
Boeckmann, Egil	.....	St. Paul
Boehme, E. J.	.....	Minneapolis
Boefenkamp, F. W.	.....	Luverne
Bohl, G. W.	.....	Ada
Bohland, E. H.	.....	St. Paul
Bolger, L. R.	.....	Minneapolis
Bolander, W. L.	.....	Rochester
Bolander, H. L.	.....	St. Paul
Boley, E. S.	.....	Stillwater
Boline, C. A.	.....	Battle Lake
Bolsta, Charles	.....	Ortonville
Boman, P. G.	.....	Duluth
Boody, G. J., Jr.	.....	Dawson
Booth, A. E.	.....	Minneapolis
Boothby, V. M.	.....	Rochester
Bourne, C. A.	.....	Minneapolis
Borg, J. F.	.....	St. Paul
Borgerson, A. H.	.....	Sebek
Borgeson, E. J.	.....	Minneapolis
Borman, C. N.	.....	Minneapolis
Borreson, Baldwin	.....	Thief River Falls
Bosland, H. G.	.....	Vernadale
Bossert, C. S.	.....	Mora
Bossingham, O. N.	.....	Lake Benton
Boston, B. T.	.....	Morristown
Boutin, R. R.	.....	St. Paul
Bouman, H. A. H.	.....	Minneapolis
Bouquet, B. J.	.....	Wabasha
Bowen, R. L.	.....	Hibbing
Bowing, H. H.	.....	Rochester
Boyd, L. M.	.....	Alexandria
Boyer, S. H., Jr.	.....	Duluth
Boyer, S. H., Sr.	.....	Duluth
Boynton, Ruth	.....	Minneapolis
Boysen, Herland	.....	Wadena
Boysen, E.	.....	Pelican Rapids
Boysen, Peter	.....	Pelican Rapids
Braasch, W. F.	.....	Rochester
Bracken, H. M.	.....	Claremont, Calif.
Brand, G. D.	.....	St. Paul
Brand, W. A.	.....	Redwood Falls
Branham, D. S.	.....	Albert Lea
Branton, A. F.	.....	Willmar
Branton, B.	.....	Willmar
Bray, A. F.	.....	Wadena
Bratrud, O. E.	.....	Thief River Falls
Bratrude, E. J.	.....	St. James
Braverman, N. J.	.....	Duluth
Bray, E. R.	.....	St. Paul
Bray, K. E.	.....	Park Rapids
Bray, P. N.	.....	Duluth
Bray, R. B.	.....	Biwabik
Bregel, F. W.	.....	St. James
Brey, E. L.	.....	Wabasso
Bright, J. F.	.....	St. Paul
Brigham, C. F.	.....	St. Cloud
Brigham, Frank	.....	Watkins
Brink, A. A.	.....	Baudette
Brink, D. M.	.....	Isle
Broadie, T. E.	.....	St. Paul
Broders, A. C.	.....	Rochester
Brodie, W. D.	.....	St. Paul
Broker, W. S.	.....	Wadena
Brown, C. C.	.....	Minneapolis
Brooks, G. N.	.....	Stillwater
Brown, A. E.	.....	Rochester
Brown, A. H.	.....	Pipestone
Brown, E. D.	.....	Paynesville
Brown, E. I.	.....	St. Paul
Brown, E. J.	.....	Minneapolis
Brown, J. C.	.....	St. Paul
Brown, P. L.	.....	Carleton Place
Brown, P.	.....	Rochester
Brown, R. W.	.....	Rochester
Browne, H. C., Jr.	Rochester
Brownstone, Manuel	Sandstone
Brumm, H. J.	Rochester

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Bryant, O. R.	Minneapolis	Clay, L. B.	Minneapolis	Demo, P. W.	Wells
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Buck, F. H.	Shakopee	Claydon, H. E.	Zumbrota	Derauf, B. L.	St. Paul
Buckley, R. P.	Duluth	Claydon, L. E.	Red Wing	Desjardins, A. U.	Rochester
Buie, L. A.	Rochester	Clement, J. B.	Lester Prairie	Deuterman, J. L.	Elgin, Ill.
Bulinski, T. J.	St. Paul	Clement, T. G.	Duluth	Devereaux, T. J.	Wayzata
Bullard, Kenneth	Minneapolis	Cleveland, W. H.	Rochester	Dewey, D. H.	Owatonna
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Burchell, H. B.	Rochester	Clothier, E. F.	Elk River	Diehl, H. S.	Minneapolis
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Burns, H. D.	Albert Lea	Cohen, S. S.	Oak Terrace	Dixon, C. F.	Rochester
Burns, M. A.	Milan	Colby, Woodard	St. Paul	Dockerty, M. B.	Rochester
Burns, R. M.	St. Paul	Cole, H. B.	Redwood Falls	Doering, R. E.	Minneapolis
Burton, C. G.	St. Paul	Cole, J. G.	Redwood Falls	Dolan, C. P.	Worthington
Burton, J. C.	Buhl	Cole, W. H.	St. Paul	Dolder, F. C.	Eyota
Busch, J. C.	St. Cloud	Collie, H. G.	St. Paul	Doleman, N. F.	Tintah
Bushard, W. J.	Bird Island	Collins, A. N.	Duluth	Doman, V. W.	Lakefield
Busher, H. H.	St. Paul	Collins, H. C.	Duluth	Doms, H. C.	Slayton
Bussey, C. D.	Rochester	Collins, J. S.	Wabasha	Donaldson, C. S.	Foley
Butler, J. K.	Carlton	Colvin, A. R.	Fergus Falls	Donath, D. H.	Rochester
Butler, John	Minneapolis	Combacker, L. C.	Rochester	Donohue, P. F.	St. Paul
Butt, H. R.	Rochester	Comfort, M. W.	Rochester	Donovan, D. L.	Albert Lea
Buttuff, C. R.	Freeborn	Condit, W. H.	Minneapolis	Doolittle, L. E.	Duluth
Butzer, J. A.	Mankato	Conner, H. M.	Rochester	Dordal, J.	Sacred Heart
Buzzelle, L. K.	Minneapolis	Connor, C. E.	St. Paul	Dorge, R. I.	Minneapolis
		Conway, J. F.	Rochester	Dornblaser, H. B.	Minneapolis
		Cook, C. K.	St. Paul	Dorsey, G. C.	Minneapolis
		Cook, E. N.	Rochester	Dove, C. M.	St. Paul
		Cook, H. W.	Minneapolis	Dowdlat, R. W.	Cologne
		Cook, J. M.	Staples	Dowsell, W. J.	Kerkhoven
		Cooney, H. C.	Princeton	Doxey, G. L.	Minneapolis
		Cooper, M. D.	Winnebago	Doyle, G. C.	Duluth
		Corbett, J. F.	Minneapolis	Doyle, L. O.	Minneapolis
		Corniea, A. D.	Minneapolis	Drake, C. B.	St. Paul
		Corwin, W. C.	Rochester	Drake, C. R.	Minneapolis
		Cosgriff, J. A.	Bird Island	Dredge, H. P.	Sandstone
		Cottam, Gilbert	Minneapolis	Drill, H. E.	Hopkins
		Counsellor, V. S.	Rochester	Drips, D. G.	Rochester
		Countryman, R. S.	St. Paul	Drought, W. W.	Fergus Falls
		Covell, W. W.	St. Peter	Dry, T. J.	Rochester
		Coventry, W. D.	Duluth	Dubbe, F. H.	New Ulm
		Coventry, W. D.	Duluth	DuBois, J. F.	Sauk Center
		Cowern, E. W.	North St. Paul	Duff, E. R.	Minneapolis
		Crafts, L. M.	Minneapolis	Dugan, L. F.	Faribault
		Cragg, R. W.	Rochester	Dukelow, D. A.	Minneapolis
		Craig, W. McK.	Rochester	Dulude, S. S.	Dassel
		Cranmer, R. R.	Minneapolis	Dumas, A. G.	Minneapolis
		Cranston, R. W.	Minneapolis	Duncan, W.	Moorhead
		Creevy, C. D.	Minneapolis	Dungay, N. S.	Northfield
		Creighton, R. H.	Minneapolis	Dunlap, E. H.	Minneapolis
		Creshaw, J. L.	Rochester	Dunn, G. R.	Minneapolis
		Cress, E. E.	Boyd	Dunn, J. N.	St. Paul
		Cress, P. J.	Ellsworth	Duryea, W. M.	Minneapolis
		Crewe, J. E.	Rochester	Dutton, C. E.	Minneapolis
		Critchfield, L. R.	St. Paul	Dvorak, B. A.	Minneapolis
		Cronwell, B. J.	Austin	Dwan, P. F.	Minneapolis
		Crow, E. R.	Arlington	Dworak, A. F.	Walker
		Crumpacker, L. K.	Rochester	Dworsky, S. D.	Minneapolis
		Culligan, J. M.	St. Paul	Dysterheit, A. F.	Gaylord
		Cumming, J. F.	Morris		
		Curtin, J. F.	Minneapolis	Earl, G. A.	St. Paul
		Curtis, R. A.	Le Center	Earl, John	St. Paul
		Cusick, P. L.	Rochester	Earl, Robert	St. Paul
		Cutler, H. H.	Rochester	Eaton, L. McK.	Rochester
		Cutts, George	Minneapolis	Eberlin, E. A.	Glenwood
		Cutts, R. E.	Minneapolis	Ecker, A. D.	Rochester
				Eckhardt, C. L.	Minneapolis
		Dack, L. E.	St. Paul	Eckman, R. J.	Duluth
		Dady, F. E.	Minneapolis	Ederer, J. J.	Mahnomen
		Dahl, E. O.	Minneapolis	Edlund, G.	St. Paul
		Dahl, G. A.	Mankato	Edwards, J. W.	St. Paul
		Dahl, J. A.	Minneapolis	Edwards, R. T.	Elysian
		Dahlin, I. T.	Aurora	Edwards, T. J.	St. Paul
		Daignault, Oscar	Benson	Ehrenberg, C. J.	Minneapolis
		Daniel, D. H.	Minneapolis	Ehrlich, S. F.	Minneapolis
		Daniel, L. M.	Minneapolis	Eich, Matthew	Minneapolis
		Danielson, K. A.	Litchfield	Eller, John	Park Rapids
		Danielson, Lennox	Litchfield	Eisenstadt, D. H.	Minneapolis
		Daugherty, E. B.	St. Paul	Eitel, G. D.	Minneapolis
		Daugherty, L. E.	St. Paul	Ekblad, J. W.	Duluth
		Davis, A. C.	Rochester	Eklund, E. J.	Norwood
		Davis, B. F.	Duluth	Elias, F. J.	Duluth
		Davis, Herbert	St. Paul	Elkins, E. C.	Rochester
		Davis, I. G.	Rushford	Ellingson, A. R.	Detroit Lakes
		Davis, L. T.	Wadena	Ellis, E. W.	Elgin
		Davis, R. D.	Clearbrook	Ellison, D. E.	Minneapolis
		Davis, T. C.	Wadena	Ellison, F. E.	Monticello
		Davis, William	St. Paul	Else, E. M.	Glenwood
		Day, L. A.	Rochester	Else, J. R.	Glenwood
		Dearing, W. H., Jr.	Rochester	Ely, O. S.	South St. Paul
		DeBoer, Hermanus	Edgerton	Emanuel, K. W.	Duluth
		Dedolph, Karl	St. Paul	Emerson, E. C.	St. Paul
		Dedolph, T. H.	Braham	Emmerson, W. S.	Mayer
		Deeds, C. D.	Rochester	Emmett, J. L.	Rochester
		Delavan, P. A.	St. Paul		

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*Deceased.

Habein, H. C.	Rochester
Haberman, Emil	Osakis
Hacking, F. H.	Minneapolis
Haes, J. E.	Vernon Center
Haessly, S. B.	Faribault
Hagaman, G. K.	St. Paul
Hagen, O. E.	Butterfield
Hagberg, O. J.	Moorhead
Haggard, G. D.	Minneapolis
Haight, G. G.	Audubon
Haines, D. J., Jr.	Rochester
Haines, J. H.	Stillwater
Haines, S. F.	Rochester
Halenbeck, P. L.	St. Cloud
Hall, A. E.	Virginia
Hall, A. R.	St. Paul
Hall, B. E.	Rochester
Hall, C. E.	St. Paul
Hall, M.	Minneapolis
Halladay, G. J.	Rush City
Hallberg, C. A.	Minneapolis
Hallenbeck, D. F.	Rochester
Hallock, Philip	Minneapolis
Halloran, W. H.	Jackson
Halpern, D. J.	Brewster
Halpin, J. E.	Rush City
Hamel, A. L.	Minneapolis
Hamm, L. S.	Minneapolis
Hamlin, G.	Minneapolis
Hammar, L. M.	Butterfield
Hammer, H. J.	Rochester
Hammermeister, T. F.	New Ulm
Hammes, E. M.	St. Paul
Hammond, A. J.	Minneapolis
Hammond, J. F.	St. Paul
Hand, W. R.	Elbow Lake
Hank, C. L.	Duluth
Hankins, G. G.	Minneapolis
Hannah, H. B.	Minneapolis
Hanover, R. D.	Littlefork
Hansen, C. O.	Minneapolis
Hansen, E. W.	Minneapolis
Hansen, O. S.	Minneapolis
Hanson, A. M.	Faribault
Hanson, E. C.	Park Rapids
Hanson, E. C.	New York Mills
Hanson, E. O.	Cloquet
Hanson, H. V.	Minneapolis
Hanson, H. V.	Minneapolis
Hanson, M. B.	Minneapolis
Hanson, W. A.	Minneapolis
Harlowe, H. E.	Virginia
Harmon, G. D.	St. Paul
Harriman, L.	Howard Lake
Harrington, C. D.	Minneapolis
Harrington, F. E.	Minneapolis
Harrington, S. W.	Rochester
Harris, N.	Hibbing
Harrison, P. W.	Worthington
Hart, V. L.	St. Paul
Hart, W. E.	Monticello
Hartfil, W. F.	St. Paul
Hartley, E. C.	St. Paul
Hartman, H. R.	Rochester
Hartmann, C. M.	Fairfax
Hartnagel, G. F.	Red Wing
Haug, E. B.	Claremont
Hartzel, T. H.	Minneapolis
Haskell, A. D.	Alexandria
Hassett, M. F.	St. Paul
Hassett, R. G.	Mankato
Hastings, D. R.	Minneapolis
Hatch, W. E.	Duluth
Hathaway, S. J.	Proctor
Hauge, M. I.	Clarkfield
Hauge, M. E.	Clarksburg
Hause, E. H.	Twin Valley
Hause, V. P.	St. Paul
Havel, H. W.	St. Jorda
Havel, T. E.	Blue Earth
Haven, W. K.	Minneapolis
Havens, F. Z.	Rochester

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Hoffman	Hawkins, V. J.	St. Paul	Hoff, H. O.	Duluth	Johnson, D. W.	Fairmont
Wadena	Hawkinson, L. P.	Crosby	Hoffert, H. E.	Minneapolis	Johnson, E. W.	Bemidji
Minneapolis	Hawkinson, L. F.	Brainerd	Hoffman, M. H.	St. Paul	Johnson, E. W.	Minneapolis
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Montrose	Hayes, M. F.	Nashauk	Holcomb, O. W.	St. Paul	Johnson, H. P.	Fairmont
Rochester	Haynes, A. L.	Faribault	Holdridge, George	Poley	Johnson, H. P.	Harmony
Albert Lea	Head, D. P.	Minneapolis	Holl, P. M.	Minneapolis	Johnson, J. A.	St. Paul
St. Peter	Head, G. D.	Minneapolis	Hollands, W. H.	Fisher	Johnson, J. A.	Minneapolis
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Minneapolis	Heck, F. J.	Rochester	Holmberg, C. J.	Minneapolis	Johnson, O. H.	Redwood Falls
Minneapolis	Heck, W. W.	St. Paul	Holmberg, L. J.	Canby	Johnson, O. J.	Lyle
Rochester	Hedback, A. E.	Minneapolis	Holmen, R. W.	St. Paul	Johnson, O. V.	Fergus Falls
Osakis	Hedberg, G. A.	Nopeming	Holmes, A. E.	Rush City	Johnson, P. C.	Tyler
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Center	Hedenstrom, F. G.	St. Paul	Holst, C. F.	Little Falls	Johnson, R. B.	Lanesboro
Faribault	Hedenstrom, L. H.	Cambridge	Holst, J. B.	Little Falls	Johnson, R. E.	Minneapolis
St. Paul	Hedlund, R. F.	Chicago	Holt, G. W.	Wabasha	Johnson, R. E.	Worthington
Butterfield	Hedlund, C. J.	Atwater	Holt, J. E.	St. Paul	Johnson, R. G.	St. Paul
Moorhead	Hegge, O. H.	Austin	Holt, W. B.	Minneapolis	Johnson, S. M.	Minneapolis
Minneapolis	Hegge, R. S.	Austin	Holtan, Theodore	Waterville	Johnson, T. H.	San Francisco, Calif.
Audubon	Heiam, W. C.	Cook	Hopkins, G. W.	St. Paul	Johnson, Walfred	Sauk Center
Rochester	Heiberg, E. A.	Fergus Falls	Horton, B. T.	Rochester	Johnson, Y. T.	Minneapolis
Stillwater	Heilman, D. M. H.	Rochester	Horwitz, S. E.	Minneapolis	Jolin, F. M.	Grand Rapids
Rochester	Heilman, F. R.	Rochester	Hottinger, R. C.	Janesville	Jolin, R. V.	Grand Rapids
St. Cloud	Heim, R. J.	Fairmont	Houkom, Bjarne	Minneapolis	Jones, A. W.	Red Wing
Virginia	Heimark, J. J.	Duluth	House, Z. E.	Cass Lake	Jones, E. M.	St. Paul
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Minneapolis	Helland, G. M.	Spring Grove	Howard, M. I.	Mankato	Jones, W. R.	Minneapolis
Minneapolis	Helland, J. W.	Spring Grove	Howard, W. S.	St. Paul	Jordan, L. S.	Granite Falls
Shish City	Helm, Standiford	Rochester	Howell, L. P.	Rochester	Josewich, Alexander	Minneapolis
Minneapolis	Helmholtz, H. F.	Howard Lake	Hoyer, L. J.	Brainerd	Josewski, R. J.	Stillwater
Minneapolis	Helseth, H. K.	Thief River Falls	Hubbard, O. E.	Brainerd	Joyce, G. L.	Rochester
Minneapolis	Hempstead, B. E.	Rochester	Hubin, E. G.	Deerwood	Judd, E. S. Jr.	Rochester
Minneapolis	Hendstead, Werner	Brainerd	Hubly, J. W.	Rochester	Juergens, H. M.	Belle Plaine
Minneapolis	Hench, P. S.	Rochester	Huenekens, E. J.	Minneapolis	Juergens, H. M.	Red Wing
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Minneapolis	Henderson, M. S.	Rochester	Hullsiek, R. B.	St. Paul	Jump, W. C.	Kasson
Minneapolis	Hendrick, J. A. Jr.	Rochester	Hultkrans, J. C.	Minneapolis	Junnila, B. O.	Grand Rapids
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Minneapolis	Hendrickson, J. F.	Wadena	Humphrey, W. R.	Stillwater	Kahala, Arthur	Crookston
Minneapolis	Hendrickson, J. F.	Wadena	Hunt, A. B.	Rochester	Kahler, J. E.	Rochester
Minneapolis	Hengstler, W. R.	St. Paul	Hunt, R. C.	Fairmont	Kalin, O. T.	Minneapolis
Minneapolis	Henney, W. H.	McIntosh	Hunte, A. F.	San Carlos, Ariz.	Kalinoff, D.	Stillwater
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Minneapolis	Heron, R. C.	St. Paul	Jackman, R. J.	Rochester	Keefe, Rolland	St. Paul
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Minneapolis	Hertz, C. S.	Rochester	Jacobs, G. C.	Fergus Falls	Kelly, B. W.	Aitkin
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Minneapolis	Hewitt, E. S.	Rochester	Jacobson, Clarence	Chisholm	Kelly, J. V.	St. Paul
Minneapolis	Hewitt, R. M.	Rochester	Jacobson, D. J.	Blackduck	Kelly, P. H.	St. Paul
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Minneapolis	Heyerdale, W. W.	Rochester	Jameson, E. F.	Brainerd	Kemble, J. W.	Plattsburg, N. Y.
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Minneapolis	Higgins, J. H.	Minneapolis	Jennings, M. H.	Minneapolis	Kemp, M. W.	Anoka
Minneapolis	Higgs, W. W.	Minneapolis	Jensen, A. H.	Hutchinson	Kendahl, A. M.	Jasper
Minneapolis	Hildebrand, A. G.	Rochester	Jensen, A. M.	Brownston	Kendrick, T. D. H.	Rochester
Minneapolis	Hilding, A. C.	Duluth	Jensen, Harry	Minneapolis	Kenefick, E. V.	St. Paul
Minneapolis	Hilger, A. W.	St. Paul	Jensen, H. H.	Atwater	Kennedy, C. C.	Minneapolis
Minneapolis	Hilger, D. D.	St. Paul	Jensen, M. J.	Minneapolis	Kennedy, J. F.	Minneapolis
Minneapolis	Hilger, L. A.	St. Paul	Jensen, R. J.	Rochester	Kennedy, R. L. J.	Rochester
Minneapolis	Hill, E. J.	Minneapolis	Jensen, T. J.	Duluth	Kennedy, W. A.	St. Paul
Minneapolis	Hill, F. E.	Duluth	Jerome, Bourne	Philadelphia, Pa.	Kepler, E. J.	Rochester
Minneapolis	Hilleboe, H. E.	St. Paul	Jesion, J. W.	St. Paul	Kerkhof, A. C.	Minneapolis
Minneapolis	Hines, E. A. Jr.	Rochester	Jewett, R. E.	Rochester	Kerlan, Irvin	Minneapolis
Minneapolis	Hiniker, L. P.	St. Paul	Johanson, W. G.	St. Paul	Kerlan, S. Z.	Aitkin
Minneapolis	Hiniker, P. J.	Le Sueur	Johnson, A. B.	Minneapolis	Kermott, L. H. Jr.	Rochester
Minneapolis	Hinsaw, H. C.	Duluth	Johnson, A. E.	Red Wing	Kern, M. J.	St. Cloud
Minneapolis	Hirschboeck, F. J.	Minneapolis	Johnson, A. E.	Minneapolis	Kernohan, J. W.	Rochester
Minneapolis	Hirschfelder, A. D.	Duluth	Johnson, A. M.	St. Paul	Kerr, J. G.	Rochester
Minneapolis	Hirschfield, M. S.	Duluth	Johnson, C. E.	Pine River	Kerschbaumer, Louis	St. Peter
Minneapolis	Hirshfield, F. R.	Minneapolis	Johnson, C. M.	Dawson	Kertes, G.	Minneapolis
Minneapolis	Hitchings, W. S.	Lakefield			Kesting, Herman	St. Paul
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Minneapolis	Hobbs, C. A.	Minneapolis			Keyes, C. R.	Duluth
Minneapolis	Hochfiter, J. J.	St. Paul			Keyes, J. D.	Winona
Minneapolis	Hodapp, R. J.	Willmar			Kibbe, O. A.	Minneapolis
Minneapolis	Hodge, S. V.	Minneapolis			Kibler, F. E.	Austin
Minneapolis	Hodgson, C. H.	Rochester				

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Medelman, J. P.....St. Paul
Meinert, A. E.....Winona
Meland, E. L.....Minneapolis
Melby, Benedik.....Bloomington
Melby, O. F.....Thief River Falls
Melzer, G. R.....Lyle
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Merkert, G. L.....Minneapolis
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Meyer, P. F.....Faribault
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Meyerding, H. W.....Rochester
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Michel, H. H.....Minneapolis
Michelson, H. E.....Minneapolis
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Miller, F. J.....Spokane, Wash.
Miller, H. A.....Fairmont
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Miller, V. I.....Mankato
Miller, W. A.....New York Mills
Mills, J. L.....Winnebago
Milton, J. S.....Minneapolis
Miners, G. A.....Deer River
Mingo, F. E.....Hugo
Mitby, I. L.....Hibbing
Mitchell, E. C.....Mound
Mitchell, R. S.....Grand Meadow
Moberg, C. W.....Lake Park
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Moe, Thomas.....Moose Lake
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Moersch, H. J.....Rochester
Moga, J. A.....St. Paul
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Molander, H. A.....St. Paul
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Monson, E. M.....Minneapolis
Monson, L. J.....Canby
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Montgomery, T. R.....Rochester
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More, C. W.....Eveleth
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Moren, H. O., Jr.....Amboy
Moriarty, Bernice.....St. Paul
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Mork, B. O., Jr.....Worthington
Morley, G. A.....Crookston
Morlock, C. G.....Rochester
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Morse, M. P.....Le Roy
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Morse, C. R.....Zumbrota
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Mortenson, N. G.....St. Paul
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Mosby, M. E.....Long Prairie
Moses, Joseph, Jr.....Northfield
Moses, R. R.....Kenyon
Moss, M. M.....St. Paul
Mouritsen, G. J.....Fergus Falls
Moussel, L. H.....Rochester
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Moyihan, T. J.....St. Paul
Mueller, S. C.....Duluth
Muller, R. T.....St. Paul
Mulligan, A. M.....Brainerd
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Mundell, B. J.....Rochester
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Murphy, I. J.....Minneapolis
Mussey, R. D.....Rochester

Myers, J. A.....Minneapolis
Myers, Thomas.....St. Paul
Myre, C. R.....Paynesville

Naegeli, A. E.....St. Paul
Naegeli, Frank.....Fergus Falls
Nagel, H. D.....Waconia
Nash, L. A.....Rochester
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Nauth, W. W.....Winona
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Nelson, E. H.....Owatonna
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Nelson, Harvey.....Minneapolis
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Nelson, N. P.....Brainerd
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Nelson, O. L. N.....Minneapolis
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Nelson, W. I.....Minneapolis
Nelson, W. O. B.....Fergus Falls
Ness, C. M.....Cambridge
Neumann, C. A.....Winona
New, G. B.....Rochester
Newhart, Horace.....Minneapolis
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Nicholson, M. A.....Duluth
Nilles, L. J.....Rollingstone
Nilson, H. J.....North Mankato
Ninneman, N. N.....Silver Lake
Nissen, A. S.....St. Peter
Noble, J. F.....St. Paul
Noble, J. L.....St. Paul
Nord, G. T.....Minneapolis
Nordland, Martin.....Minneapolis
Nordman, W. F.....Mora
Norman, J. F.....Crookston
Norrgard, H. T.....Milan
Norris, E. H.....Minneapolis
Norris, N. T.....Caledonia
Noth, H. W.....Minneapolis
Noth, P. H.....Rochester
Novak, E. E.....New Prague
Nuessle, W. G.....Springfield
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Nye, K. A.....St. Paul
Nye, L. L.....St. Paul
Nygren, W. T.....Braham
Nystrom, Ruth.....Minneapolis
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Ochsner, C. G.....Wabasha
O'Connor, D. C.....Eden Valley
O'Connor, L. J.....St. Paul
Odell, H. M.....Rochester
O'Donnell, D. M.....Ononville
O'Donnell, J. E.....Minneapolis
Oeljen, S. C. G.....Waseca
Oerting, Harry.....St. Paul
Ogden, Warner.....St. Paul
Ohage, Justus, Jr.....St. Paul
O'Hanlon, J. A.....Proctor
Ohnstad, J. L.....McIntosh
Olds, G. H.....Waseca
Olds, J. W.....Rochester
O'Leary, P. A.....Rochester
Oliver, C. L.....Graceville
Oliver, L. E.....Graceville
Olmanson, E. G.....St. Peter
Olsen, A. M.....Rochester
Olsen, E. G.....Minneapolis
Olson, A. C.....Minneapolis
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Olson, A. O.....Duluth
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Olson, E. A.....Pine Island
Olson, F. A.....Minneapolis
Olson, G. E.....West Concord
Olson, K. L.....Gibson
Olson, O. A.....Minneapolis
Olson, R. G.....Minneapolis
Ongard, L. K., Jr.....Houston
Ongard, L. K., Sr.....Houston
Oppegaard, C. L.....Crookston
Oppegaard, M. O.....Crookston

Oppen, E. G.....Minneapolis
O'Reilly, B. E.....St. Paul
Ormond, D. T.....Waconia
Osborn, Lida.....Mankato
Ostergren, E. W.....St. Paul
Otto, H. C.....Frazee
Oulette, A. J.....St. Paul
Owre, Oscar.....Minneapolis
Page, C. V.....St. Paul
Page, R. L.....St. Charles
Palmer, C. F.....Albert Lea
Palmer, H. A.....Eveleth
Palmer, W. L.....Albert Lea
Pankratz, P. J.....Mountain Lake
Paradis, W. G.....Crookston
Parker, D. M.....Oakland, Calif.
Parker, O. W.....Ely
Parker, R. L.....Rochester
Parkhill, E. M.....Rochester
Parks, A. H.....Minneapolis
Parson, L. R.....Elbow Lake
Parsons, J. G.....Crookston
Pasek, A. W.....Cloquet
Passer, A. W.....Olivia
Patterson, W. E.....Minneapolis
Patterson, W. E.....Westbrook
Patterson, W. L.....Fergus Falls
Patton, G. D.....Rochester
Paulsen, E. L.....Minneapolis
Paulson, D. L.....Rochester
Paulson, J. A.....Rochester
Paulson, T. S.....Fergus Falls
Pearman, R. O. D.....Rochester
Pearshall, R. P.....Virginia
Pearson, B. F.....Shakopee
Pearson, F. R.....St. Paul
Pedersen, A. H.....St. Paul
Pederson, R. M.....Minneapolis
Pellettierre, E. V.....Thief River Falls
Pemberton, J. de J.....Rochester
Penhall, F. W.....Morton
Penn, G. E.....Mankato
Pennie, D. F.....Duluth
Pennington, Reuben.....Minneapolis
Peppard, T. A.....Minneapolis
Peruzzi, Thelma.....Rochester
Perry, C. G.....St. Paul
Persons, C. E.....Marshall
Pertl, A. L.....Canby
Petersen, J. R.....Minneapolis
Petersen, M. C.....Willmar
Petersen, P. C.....Braham
Petersen, Thorvald.....Minneapolis
Peterson, A. A.....Mora
Peterson, D. B.....St. Paul
Peterson, E. N.....Virginia
Peterson, H. O.....Minneapolis
Peterson, Henry.....Minneapolis
Peterson, H. W.....Minneapolis
Peterson, J. H.....Duluth
Peterson, J. L. E.....St. Paul
Peterson, N. P.....Minneapolis
Peterson, O. H.....Minneapolis
Peterson, O. L.....Cokato
Peterson, P. E.....Minneapolis
Peterson, R. A.....Vesta
Peterson, V. N.....St. Paul
Peterson, W. C.....Minneapolis
Petit, L. J.....Minneapolis
Petraborg, W. T.....Aitkin
Peyton, W. T.....Minneapolis
Pfunder, M. C.....Minneapolis
Phelps, K. A.....Minneapolis
Phillips, A. E.....Delano
Phillips, W. H.....Jordan
Pierce, C. H.....Wadena
Piper, M. C.....Rochester
Piper, W. A.....Mountain Lake
Platou, E. S.....Minneapolis
Plondke, F. J.....St. Paul
Plonske, C. J.....Faribault
Plowman, E. T.....Marble
Plummer, W. A.....Rochester
Pogue, R. E.....Glendale, Calif.
Pohl, J. F. M.....Minneapolis
Poirier, J. A.....Forest Lake
Pollard, D. W.....Minneapolis
Pollock, D. K.....Minneapolis
Pollock, L. W.....Rochester
Polzak, J. A.....Minneapolis
Pool, T. L.....Rochester
Popp, W. C.....Rochester
Poppe, F. H.....Minneapolis
Potek, David.....International Falls
Potter, R. B.....Hendricks
Potthoff, C. J.....Morgan
Power, J. E.....Duluth
Powers, F. H.....Rochester
Powers, F. W.....Barrett
Prangen, A. D.....Rochester

*Deceased.

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Pratt, F. J. Minneapolis
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Preine, I. A. Minneapolis
Preisinger, J. W. Renville
Prendergast, H. J. St. Paul
Prendergast, J. J. Carville, La.
Prickman, L. E. Rochester
Priest, R. E. Worthington
Priestley, J. T. Rochester
Prim, J. A. Minneapolis
Prins, L. R. Albert Lea
Proschel, R. K. Willmar
Proshok, C. E. Minneapolis
Pumphrey, R. E. Rochester
Purves, G. H. Lake Benton
Puumala, R. H. Cloquet

Quanstrom, V. E. Brainerd
Quello, R. O. B. Minneapolis
Quinby, T. F. Lake Wales, Fla.
Quist, H. W. Minneapolis

Raadquist, C. S. Hibbing
Radabaugh, R. C. Hastings
Raihala, John Virginia
Raiter, F. W. S. Cloquet
Raiter, R. F. Cloquet
Ralph, R. D. Rochester
Ramsey, W. R. St. Paul
Randall, A. M. Ashby
Randall, L. M. Rochester
Ransom, M. L. Hancock
Rasmussen, R. C. Minneapolis
Rasmussen, T. B. Rochester
Ratcliffe, J. J. Aitkin
Rathbun, C. A. St. Cloud
Raymond, J. H. Triumph
Reed, C. A. Minneapolis
Reeve, E. T. Elbow Lake
Reff, A. R. Crookston
Regan, J. F. Rochester
Regnier, E. A. Minneapolis
Reichelderfer, C. F. Staples
Reineke, G. F. New Ulm
Reiter, H. W. Shakopee
Rewbridge, A. G. Minneapolis
Reynolds, J. S. Minneapolis
Rhorer, J. Rochester
Rice, C. O. Minneapolis
Rice, H. G. Moorhead
Rice, H. R. Roseau
Richards, E. T. F. St. Paul
Richards, W. B. St. Cloud
Richardson, F. L. Coleraine
Richardson, F. S. Minneapolis
Richardson, H. E. St. Paul
Richdorf, L. F. Minneapolis
Richey, G. L. Cambridge
Rick, P. F. W. Le Center
Ridgway, A. M. Annandale
Rieke, W. W. Wayzata
Rigler, J. G. Minneapolis
Riley, J. B. Fergus Falls
Rimer, E. W. Breckenridge
Ringle, O. F. Walker
Rishmiller, J. H. Minneapolis
Risser, A. F. Stewartville
Risser, E. D. Winona
Ritchie, H. P. St. Paul
Ritchie, W. P. St. Paul
Ritt, A. E. St. Paul
Rivers, A. B. Rochester
Rizer, R. L. Minneapolis
Roan, C. M. Minneapolis
Robb, E. F. Minneapolis
Robbins, C. P. Winona
Robbins, O. F. Minneapolis
Roberts, L. M. Little Falls
Roberts, O. W. Owatonna
Roberts, S. W. Minneapolis
Roberts, T. S. Minneapolis
Roberts, W. E. Minneapolis
Robertson, H. E. Rochester
Robertson, J. B. Minneapolis
Robertson, P. A. Austin
Robilliard, C. M. Faribault
Robinson, J. M. Duluth
Robitsek, E. C. Minneapolis
Rochford, W. E. Minneapolis
Rodd, F. C. Minneapolis
Rodgers, C. L. Minneapolis
Roehlke, A. B. Elk River
Roemer, H. J. Winona
Rogers, S. F. St. Paul
Rogne, W. G. Spring Grove
Roholt, C. L. Waverly
Rohrer, C. A. Waterville
Rokala, H. E. Biwabik

*Deceased.

Rood, D. C. Duluth
Rose, J. T. Lakefield
Rosen, Samuel Minneapolis
Rosenberg, E. F. Rochester
Rosenfield, A. B. Pequot
Rosenholtz, Burton St. Paul
Rosenow, E. C. Rochester
Rosenow, E. C., Jr. Rochester
Rosenstiel, H. C. Rochester
Rosenthal, F. H. Grand Meadow
Rosenthal, Robert St. Paul
Rosenwald, R. M. Minneapolis
Roskilly, G. C. P. Minneapolis
Ross, W. P. Battle Lake
Rossen, R. X. St. Peter
Roth, F. D. Lewiston
Rothenburg, J. C. Springfield
Rothrock, J. L. St. Paul
Rothschild, H. J. St. Paul
Rousseau, Victor Maple Lake
Roust, H. A. Montevideo
Rowe, O. W. Duluth
Rowe, W. H. Fairmont
Rowles, E. K. Coleraine
Roy, J. A. Red Lake Falls
Roy, P. C. St. Paul
*Roy, Philemon St. Paul
Rucker, C. W. Rochester
Rucker, W. H. Minneapolis
Rud, N. E. Minneapolis
Rudell, G. L. Minneapolis
Rudie, C. N. Kenyon
Rudie, P. S. Forest Lake
Ruggles, G. McC. Forest Lake
Rubberg, G. N. St. Paul
Rumpf, C. W. Faribault
Rumpf, W. H. Faribault
Rumpf, W. H. St. Cloud
Rushton, J. G. Rochester
Russ, H. H. Blue Earth
Russeth, A. N. Minneapolis
Rusten, E. M. Minneapolis
Rutherford, W. C. St. Paul
Rutledge, D. I. Rochester
Rutledge, L. H. Detroit Lakes
Ryan, J. J. St. Paul
Ryan, J. M. St. Paul
Ryan, M. E. St. Paul
Ryan, W. J. Duluth
Ryneanson, E. H. Rochester

Sach-Rowitz, Alvin Moose Lake
Sadler, W. P. Minneapolis
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Sahr, W. G. Hutchinson
St. Cyr, K. J. Osseo
Salt, C. G. Minneapolis
Salter, R. A. Virginia
Samson, E. R. Stillwater
Samuelson, L. G. Mankato
Samuelson, Samuel Minneapolis
Sanderson, E. T. Minnetonka
Sandt, K. E. Minneapolis
Sandven, N. O. Paynesville
Sanford, A. Rochester
Sarff, O. E. Virginia
Sarnecki, M. M. St. Paul
Sateramoen, Theodore Pelican Rapids
Sather, E. R. Alexandria
Sather, R. O. Crookston
Satterlee, H. W. Lewiston
Satterlund, V. L. St. Paul
Savage, F. J. St. Paul
Sawatzky, W. A. Minneapolis
Sawyer, M. H. Rochester
Sax, S. G. Duluth
Schaf, F. H. K. Minneapolis
Schade, F. L. Worthington
Schaefer, J. F. Owatonna
Schaefer, Samuel Winona
Schaefer, W. G. Minneapolis
Schatz, F. J. St. Cloud
Scheldrup, N. H. Minneapolis
Scherer, C. A. Duluth
Scherer, L. R. Minneapolis
Schimelpfenig, G. T. Chaska
Schlesselman, George Anoka
Schlesselman, J. T. Mankato
Schmidt, G. F. Rochester
Schmidt, H. W. Minneapolis
Schmidt, P. A. Good Thunder
Schmidt, P. G. Granite Falls
Schmidt, W. R. Glencoe
Schmitt, A. F. Minneapolis
Schmitt, S. C. Los Angeles, Calif.
Schneider, H. H. Rochester
Schneider, J. P. Minneapolis
Schneider, P. J. Adams
Schock, R. B. J. St. Paul
Scholpp, O. W. Hutchinson

Schons, Edward St. Paul
Schottler, G. J. Dexter
Schottler, M. E. Minneapolis
Schroder, C. H. Duluth
Schroepfel, J. E. Winthrop
Schultz, F. C. St. Paul
Schultz, J. A. Albert Lea
Schultz, P. J. Minneapolis
Schulze, A. G. St. Paul
Schussler, O. F. Minneapolis
Schutz, E. S. Mountain Lake
Schwartz, V. J. R. Minneapolis
Schweiger, T. R. Hibbing
Schwyzer, Arnold St. Paul
Schwyzer, Gustav Minneapolis
Scofield, C. L. Benson
Scott, E. E. St. Paul
Scott, F. H. Minneapolis
Scott, H. G. Minneapolis
Searles, P. W. Rochester
Seashore, Gilbert Minneapolis
Seashore, R. T. Duluth
Secord, E. E. Rochester
Seedorf, E. E. Rochester
Schem, Max Minneapolis
Seifert, M. H. Excelsior
Seifert, O. J. New Ulm
Seitz, S. B. Barnesville
Seldon, T. H. Rochester
Selleseth, I. F. Minneapolis
Senkler, G. E. St. Paul
Senn, E. W. Owatonna
Serkland, J. C. Rothsay
Sether, A. F. St. Paul
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Shannon, S. S. Crosby
Shannon, W. R. St. Paul
Shaperman, E. P. Minneapolis
Shapiro, E. Z. Duluth
Shapiro, M. J. Minneapolis
Sharp, D. V. Minneapolis
Shastid, T. H. Duluth
Shaw, A. W. Buhl
Shedlov, Abraham Fosston
Sheedy, C. L. Austin
Sheedy, L. P. Rochester
Shelden, C. H. Rochester
Sheldon, W. D. Rochester
Shellman, J. L. St. Paul
Shelver, H. J. Ortonville
Sheppard, C. G. Hutchinson
Sheppard, Fred Hutchinson
Sheppard, P. E. Hutchinson
Sher, D. A. Cold Spring
Sherman, L. L. Luverne
Sherman, H. T. Plainview
Sherwood, G. E. Kimball
Shillington, M. A. St. Paul
Shimonek, S. W. St. Paul
Shoemaker, Rosemary Rochester
Short, Jacob St. Paul
Shrader, J. S. Jordan
Sibley, W. L. Roanoke, Va.
Sickler, J. R. Rochester
Siegmund, W. C. Minneapolis
Silver, J. D. Minneapolis
Simison, Carl Barnesville
Simison, C. W. Hawley
Simons, B. H. Chaska
Simons, E. J. Swanville
Simons, J. H. Minneapolis
Simons, L. T. St. Paul
Simons, S. J. Akeley
Simonton, K. M. Rochester
Simpson, E. D. Minneapolis
Simpson, W. C. Rochester
Sinmark, Andrew Hibbing
Singer, B. St. Paul
Siperstein, D. M. Minneapolis
Sisler, C. E. Grand Rapids
Sivertsen, Andrew Hollywood, Calif.
Sivertsen, Ivar Minneapolis
Sjostrom, L. E. Storden
Skaug, H. M. Chatfield
Skinner, H. O. St. Paul
Skinner, I. C., Jr. Rochester
Skjold, A. C. Minneapolis
Slater, S. A. Worthington
Sloan, Julius Minneapolis
Slocumb, C. H. Rochester
Slocumb, J. A. Plainview
Slyfield, F. F. Duluth
Smersh, J. F. Owatonna
Smisek, E. A. St. Paul
Smisek, F. M. Minneapolis
Smith, A. E. Minneapolis
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Smith, Archie M. Minneapolis
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Smith, B. F. Rochester

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 Smith, F. L. Rochester
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 Smith, H. R. Balaton
 Smith, L. A. Rochester
 Smith, L. G. Montevideo
 Smith, M. W. Red Wing
 Smith, N. D. Rochester
 Smith, N. M. Minneapolis
 Smith, S. J. Eveleth
 Smith, V. D. E. St. Paul
 Smith, W. R. Grand Marais
 Snell, A. M. Rochester
 Snyder, G. W. St. Paul
 Snyder, J. M. Rochester
 Solberg, R. T. Minneapolis
 Sogge, L. L. Windom
 Solberg, O. I. St. Paul
 Solmer, A. E. Mankato
 Solhaug, S. B. Minneapolis
 Solsem, F. N. Sacred Heart
 Sommer, A. W. Elmore
 Soniat, T. L. L. Rochester
 Sonnessyn, N. N. Le Sueur
 Souster, B. B. St. Paul
 Spang, A. J. Duluth
 Spano, J. P. Minneapolis
 Sperling, Louis. Minneapolis
 Spicer, F. W. Duluth
 Sprafka, J. M. St. Paul
 Sprague, R. G. Rochester
 Spratt, C. N. Minneapolis
 Spurbeck, R. G. Cloquet
 Spurr, R. J. Anoka
 Stafford, C. E. Hewitt
 Stafne, W. A. Moorhead
 Stalker, L. K. Rochester
 Stanford, C. E. Minneapolis
 Stangl, Fred. St. Cloud
 Stangl, P. E. St. Cloud
 Stanley, C. R. Worthington
 Steenrod, E. J. Rochester
 Steffens, L. A. Red Wing
 Steffens, L. F. Rochester
 Stein, R. J. Pierz
 Steinberg, C. L. St. Paul
 Steiner, I. W. Winona
 Stelter, L. A. Minneapolis
 Stensrud, H. L. Parker
 Stenstrom, A. T. Minneapolis
 Stephan, E. L. Hinckley
 Sterner, E. G. St. Paul
 Sterner, E. R. White Bear
 Steube, R. W. Alexandria
 Stevens, John. Gonvick
 Stevenson, B. M. Fulda
 Stewart, A. B. Owatonna
 Stewart, Alexander. St. Paul
 Stewart, C. A. Minneapolis
 Stewart, Gwendolyn. Faribault
 Stewart, R. I. St. Cloud
 Stewart, R. I. Minneapolis
 Stillwell, W. C. Mankato
 Stinnette, S. E. St. Paul
 Stocking, F. F. Hallock
 Stockmann, A. E. St. Paul
 Stolpestad, A. H. St. Paul
 Stolpestad, H. L. St. Paul
 Stomel, Joseph. Minneapolis
 Strachauer, A. C. Minneapolis
 Strand, E. V. Bayport
 Strate, G. E. St. Paul
 Strathern, F. P. St. Peter
 Strathern, M. L. G. Hart
 Stratte, A. K. Pine City
 Stratte, H. C. Windom
 Strauss, M. L. St. Paul
 Strobel, W. G. Duluth
 Stroebel, C. F. Northfield
 Strout, E. S. Minneapolis
 Strout, G. E. Minneapolis
 Stuart, A. B. Cloquet
 Stuhler, L. G. Rochester
 Stur, J. W. Stillwater
 Sturte, J. R. Minneapolis
 Sturmanns, S. H. Erskine
 Sukeforth, L. A. Duluth
 Sullivan, R. M. Minneapolis
 Sullivan, R. R. Minneapolis
 Sundt, Mathias. Minneapolis
 Sutherland, C. G. Rochester
 Sutherland, H. N. Elroy
 Sutton, C. S. St. Cloud

Sutton, H. R. Hoffman
 Swanson, Cephas. Minneapolis
 Swanson, I. A. St. Paul
 Swanson, P. E. Virginia
 Swanson, R. E. Minneapolis
 Swartz, F. C. Rochester
 Swedenburg, P. A. Swanville
 Sweetser, H. B. Jr. Minneapolis
 Sweetser, H. B. Sr. Minneapolis
 Sweetser, T. H. Minneapolis
 Sweitzer, S. E. Minneapolis
 Swendseen, C. G. Minneapolis
 Swendsen, J. J. St. Paul
 Swenson, R. G. Harris
 Swenson, A. O. Duluth
 Swenson, O. J. Waseca
 Swift, E. V. Jr. Rochester
 Swingle, H. F. Jr. Rochester
 Sybilrud, H. W. Briceyn

Tangen, G. M. Canby
 Tanqlin, W. G. L. Mahanomen
 Tanquist, E. J. Alexandria
 Taylor, C. W. Duluth
 Taylor, J. H. Minneapolis
 Teisberg, C. B. St. Paul
 Telford, V. J. Litchfield
 Templin, D. B. Gary, Ind.
 Tennison, W. I. III. Rochester
 Ternstrom, O. H. Minneapolis
 Thabes, J. A. Jr. Brainerd
 Thabes, J. A. Sr. Brainerd
 Thayer, E. A. Truman
 Thielen, R. D. St. Michael
 Thomas, G. E. Minneapolis
 Thomas, G. H. Minneapolis
 Thomas, Albert. St. James
 Thompson, Hewitt. Cokato
 Thompson, Arthur. St. Paul
 Thompson, F. A. Rochester
 Thompson, G. J. Minneapolis
 Thompson, H. H. Minneapolis
 Thomson, J. M. Brownsdale
 Thordarson, Theodore. Minnetota
 Thoreson, M. O. St. Paul
 Thorson, E. O. Luverne
 Thorson, O. P. Northfield
 Thyssell, F. A. Moorhead
 Tibbets, V. D. Hawley
 Tierney, C. M. Harmony
 Tift, C. R. St. Paul
 Tilderquist, D. L. Duluth
 Tillisch, J. H. Rochester
 Tingdale, A. C. Wayzata
 Tinker, C. W. Stewart
 Tofte, Josephine. Minneapolis
 Torgerson, P. Oklee
 Townsend, De Wayne. Brocton
 Traeger, C. A. Faribault
 Traxler, F. J. Henderson
 Treiglas, H. R. South St. Paul
 Trombley, R. A. Eumons
 Troost, H. B. Mankato
 Trueman, H. S. Minneapolis
 Trueman, K. R. Rochester
 Trutna, T. J. Silver Lake
 Tunstead, H. J. Minneapolis
 Tuohy, E. B. Rochester
 Tuohy, E. L. Duluth
 Turnachiff, D. D. Minneapolis
 Tweedy, G. J. Winona
 Tweedy, R. B. Winona
 Tyrrell, C. C. Minneapolis

Ude, W. H. Minneapolis
 Uhley, C. G. Crookston
 Ulrich, H. L. Minneapolis
 Undine, C. A. Minneapolis
 Urberg, S. E. Duluth

Vaaler, T. Cannon Falls
 Vadheim, A. L. Tyler
 Vail, J. B. Henning
 Valentine, W. H. Tracy
 Vandersluis, C. W. Bemidji
 Van Meier, Henry. Stillwater
 Van Slyke, C. A. St. Paul
 Van Valkenber, J. D. Floodwood
 Vaughan, V. M. Truman
 Veirs, Dean. St. Paul
 Veirs, Ruby S. St. Paul
 Venables, A. E. St. Paul
 Vercellini, C. E. Duluth
 Vezina, J. C. Mapleton
 Vickers, P. M. Rochester
 Vik, Melvin. Onamia
 Virnig, M. P. Wells

Vogel, H. A. L. New Ulm
 Vogel, J. H. New Ulm
 Von der Weyer, William. St. Paul

Waas, C. W. St. Paul
 Wagener, H. P. Rochester
 Wahlberg, E. W. Morgan
 Wahlquist, H. F. Minneapolis
 Waisman, Morris. Rochester
 Wakefield, E. G. Rochester
 Walch, A. E. Minneapolis
 Waldron, C. W. Minneapolis
 Walfred, K. A. St. Cloud
 Walker, A. E. Duluth
 Walker, A. E. St. Paul
 Walker, G. H. Minneapolis
 Wall, C. L. Minneapolis
 Wallace, M. O. Duluth
 Waller, J. D. Wilmont
 Walsh, J. J. Rochester
 Walsh, M. N. Rochester
 Walter, C. W. St. Paul
 Walters, Waltman. Rochester
 Wangenstein, O. H. Minneapolis
 Wanous, E. Z. Minneapolis
 Ward, A. W. Minneapolis
 Ward, C. E. Rochester
 Ward, P. A. Minneapolis
 Warham, T. T. Minneapolis
 Warnock, R. W. St. Paul
 Warren, C. A. St. Paul
 Warren, E. L. St. Paul
 Warren, F. S. Washington, D. C.
 Washburn, R. N. Rochester
 Wasson, L. F. Chicago City
 Watkins, C. H. Rochester
 Watson, A. M. Royalton
 Watson, C. G. Soudan
 Watson, J. A. Minneapolis
 Watson, J. D. Holdingford
 Watson, P. T. Cass Lake
 Watson, W. J. Holdingford
 Watterson, K. W. Rochester
 Watz, C. E. St. Paul
 Waugh, J. M. Rochester
 Weaver, D. F. Jr. Rochester
 Webb, R. C. Minneapolis
 Webber, E. E. Duluth
 Webber, F. L. St. Paul
 Weber, H. M. Rochester
 Webster, L. J. Ah-Gwah-Ching
 Weir, J. F. Rochester
 Weiser, G. B. New Ulm
 Weisman, S. A. Minneapolis
 Welch, M. C. St. Paul
 Wells, A. H. Duluth
 Wells, W. B. Jackson
 Wenner, W. T. St. Cloud
 Wentworth, A. J. Mankato
 Werner, O. S. Cambridge
 West, E. J. Faribault
 Westby, Magnus. Madison
 Westby, Nels. Madison
 Westernman, A. E. Montgomery
 Westernman, F. C. Montgomery
 Wethal, A. G. Minneapolis
 Wetherby, Ma. nider. Minneapolis
 Weum, T. W. Minneapolis
 Wheeler, D. W. Duluth
 Wheeler, M. W. St. Paul
 Whetstone, S. D. Winona
 Whitacre, J. C. St. Paul
 White, A. A. Minneapolis
 White, S. M. Minneapolis
 White, W. D. Minneapolis
 Whitesell, L. A. Minneapolis
 Whitmore, Frank. St. Paul
 Whitson, S. A. Aiden
 Whittemore, D. D. Bemidji
 Widen, W. F. Minneapolis
 Wiechman, F. H. St. Cloud
 Wilcox, A. E. Minneapolis
 Wilder, K. W. Minneapolis
 Wilder, R. L. Minneapolis
 Wilder, R. M. Rochester
 Wilken, P. A. Minneapolis
 Wilkinson, Stella L. Duluth
 Wilkowske, R. J. Nerstrand
 Will, W. W. Bertha
 Willcutt, C. E. Minneapolis
 Williams, A. B. St. Paul
 Williams, C. A. Pipestone
 Williams, C. K. St. Paul
 Williams, H. L. Jr. Rochester
 Williams, H. O. Lake Crystal
 Williams, L. A. Slayton
 Williams, M. R. Cannon Falls
 Williams, Robert. Minneapolis
 Williams, R. V. Rushford
 Williamson, G. A. St. Paul

*Deceased.

MAY, 1938

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Willius, F. A.....Rochester
Wilmot, C. A.....Litchfield
Wilmot, H. E.....Litchfield
Wilson, C. E.....Blue Earth
Wilson, J. A.....St. Paul
Wilson, J. V.....St. Paul
Wilson, L. B.....Rochester
Wilson, R. B.....Rochester
Wilson, R. H.....Winona
Wilson, V. O.....Minneapolis
Wilson, Warren.....Northfield
Wilson, W. D.....Rochester
Wiltout, F. G.....Lake City
Wiltout, I. G.....Oslo
Windsor, R. L.....Fergus Falls
Winer, L. H.....Minneapolis
Wingquist, C. G.....Los Angeles, Calif.
Winnick, J. B.....St. Paul
Winter, J. A.....Duluth
Winther, Nora.....Minneapolis
Witham, C. A.....Minneapolis
Withrow, M. E.....International Falls
Wittich, F. W.....Minneapolis
Wohlrahe, A. A.....Minneapolis

Wohlrahe, C. F.....Minneapolis
Wohlrahe, E. J.....Springfield
Wold, K. C.....St. Paul
Wolfe, H. H.....St. Paul
Wolff, H. J.....St. Paul
Wolff, L. H.....Rochester
Wolfram, D. J.....Rochester
Wolkoff, H. J.....St. Paul
Wolner, O. H.....St. Peter
Woltman, H. W.....Rochester
Wood, H. G.....Rochester
Woodruff, C. W.....Chatfield
Woodruff, Robert.....Rochester
Woodworth, Elizabeth.....Minneapolis
Woodworth, L. F.....Le Center
Workman, W. G.....Tracy
Wray, W. E.....Campbell
Wright, C. B.....Minneapolis
Wright, C. D.....Minneapolis
Wright, C. O.....Luverne
Wright, F. R.....Minneapolis
Wright, S. G.....Minneapolis
Wright, W. S.....Minneapolis
Wrock, D. H.....Rochester

Wunder, H. E.....Shakopee
Wyatt, O. S.....Minneapolis
Wylie, A. R. T.....Faribault
Wynne, H. M. N.....Minneapolis
Yeager, C. L.....Rochester
Yaeger, W. W.....Marshall
Ylvisaker, R. S.....Minneapolis
Yoerg, O. W.....Minneapolis
Young, H. H.....Rochester
Young, T. O.....Duluth
Young, V. A.....Duluth
Younger, L. L.....Winona
Youngman, R. A.....Fairmont
Youngren, E. R.....St. Paul
Zachman, A. H.....Melrose
Zander, C. H.....St. Paul
Zaworski, E. A.....Minneapolis
Zeien, Thomas.....North Branch
Zerme, E. E.....Fairmont
Zierold, A. A.....Minneapolis
Zimmermann, H. B.....St. Paul
Ziskin, Thomas.....Minneapolis
Zlatovskii, M. L.....Duluth